

# RECLAMATION

*Managing Water in the West*

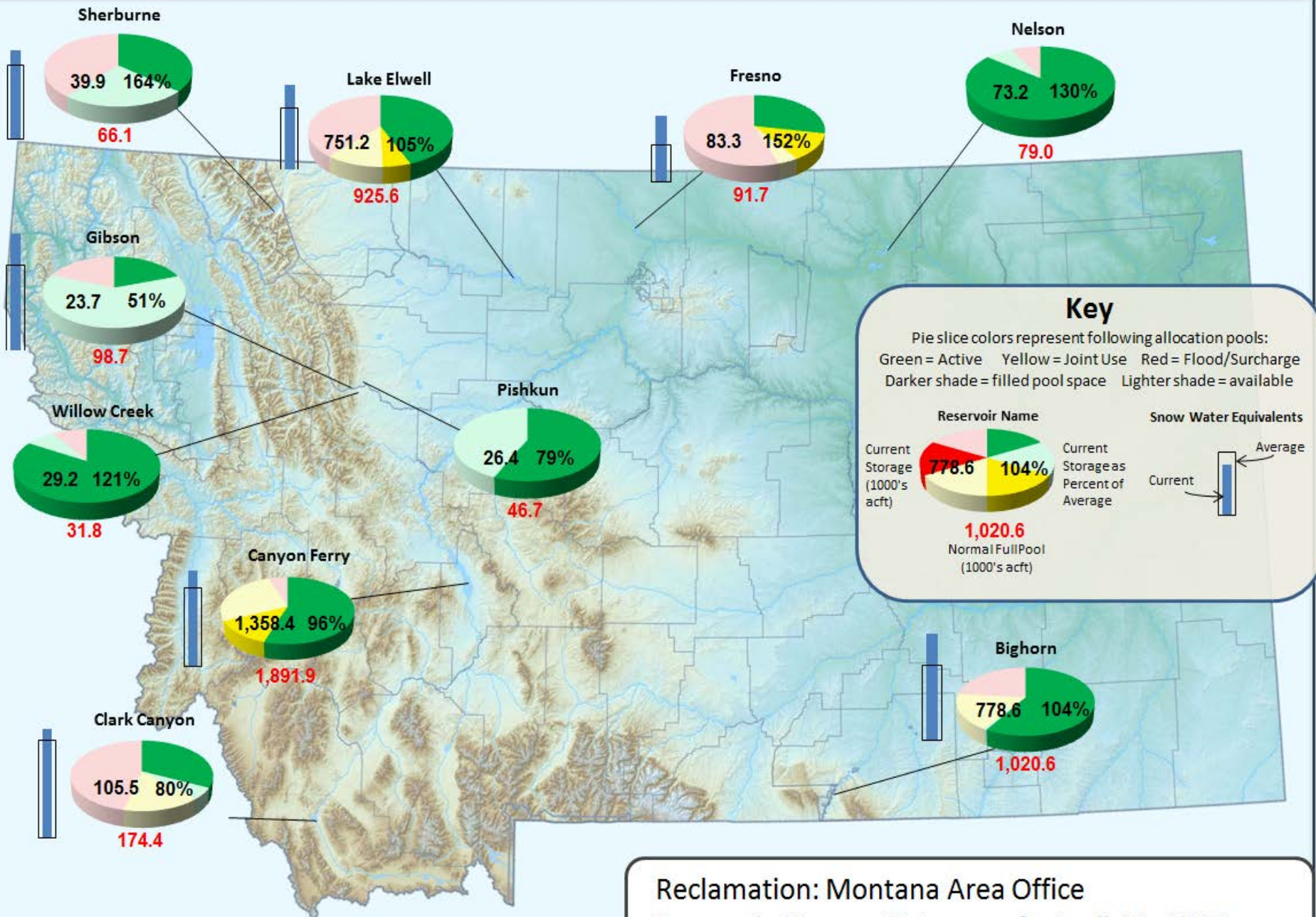
## MONTANA DROUGHT ADVISORY COMMITTEE MEETING

RESERVOIR AND RIVER OPERATIONS

April 17, 2014



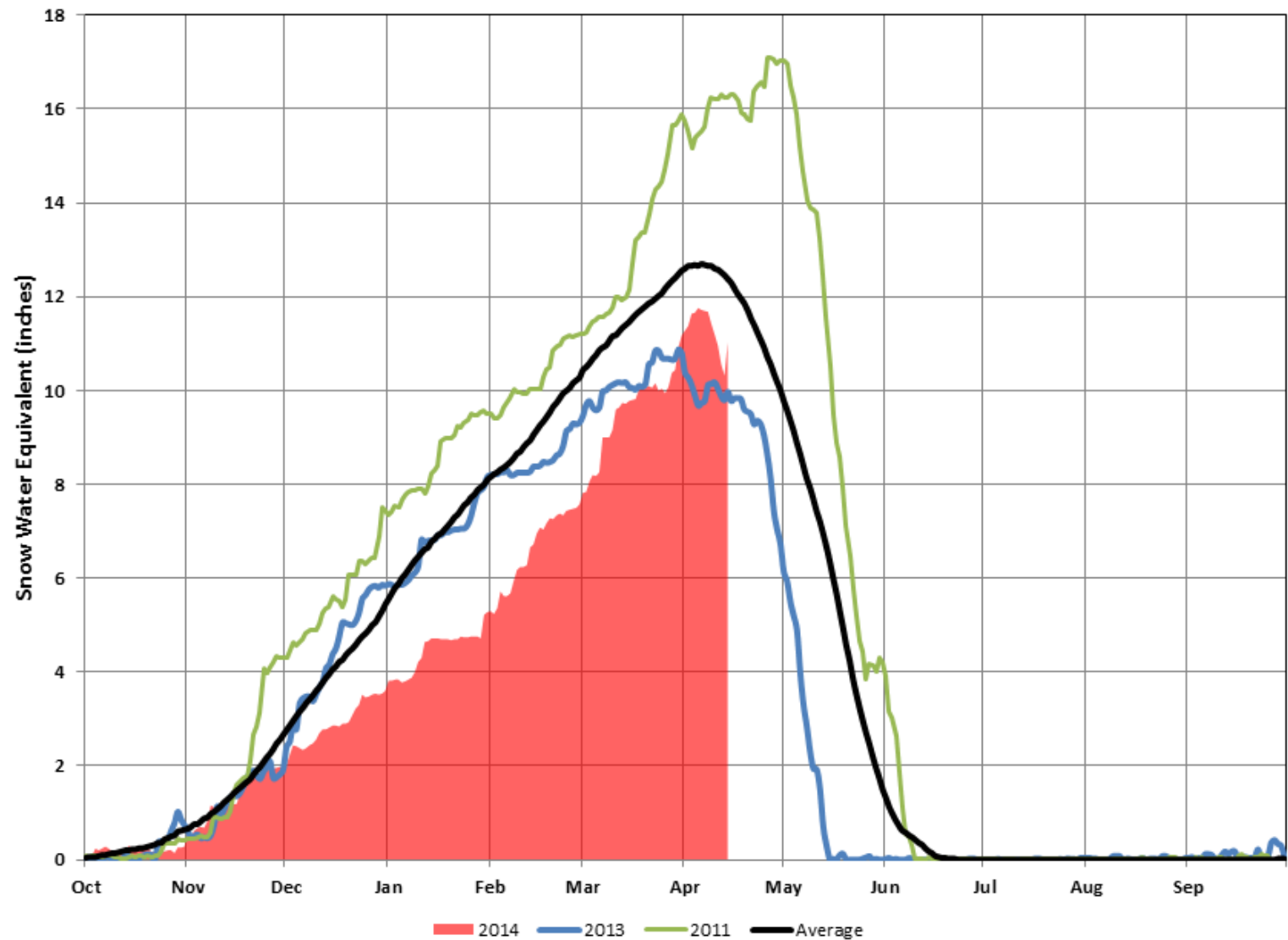
U.S. Department of the Interior  
Bureau of Reclamation



Reclamation: Montana Area Office  
Reservoir Storage Status as of : April 12, 2014

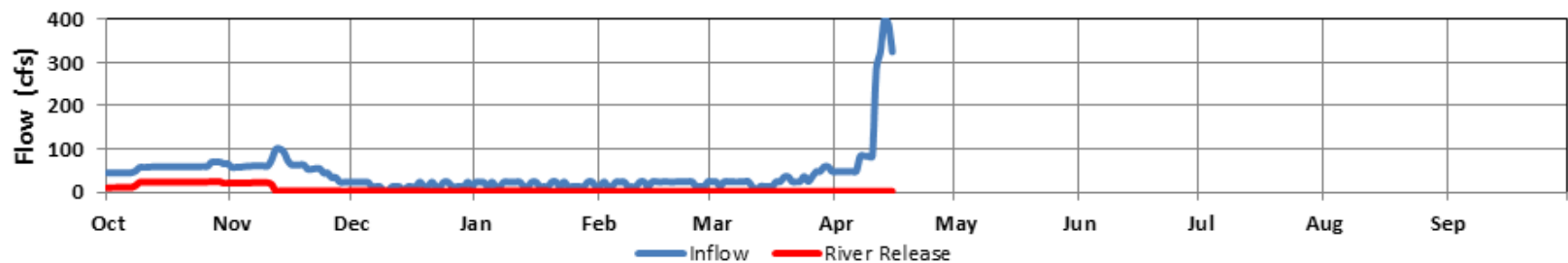
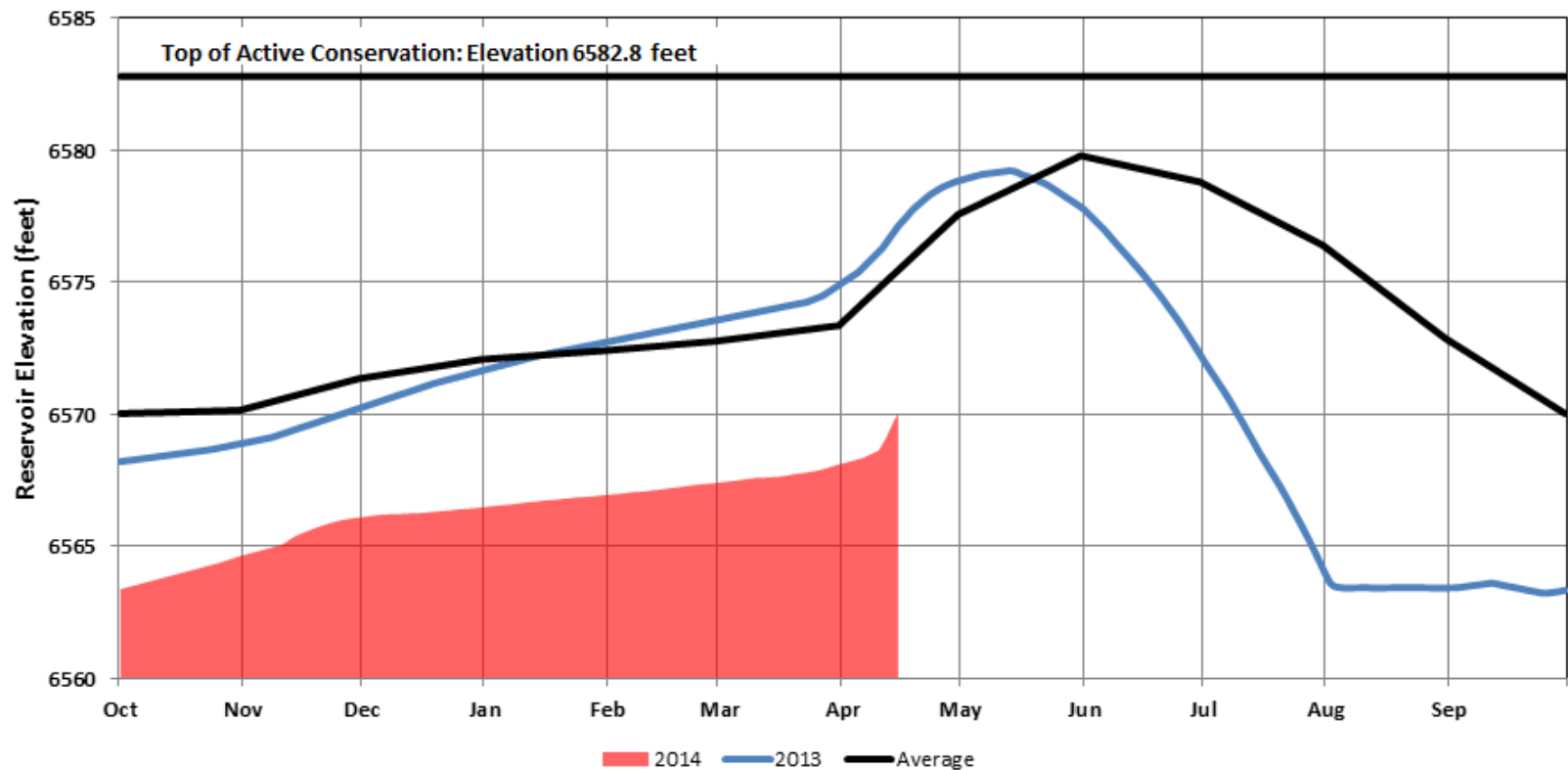


## Snowpack above Lima Reservoir



# RECLAMATION

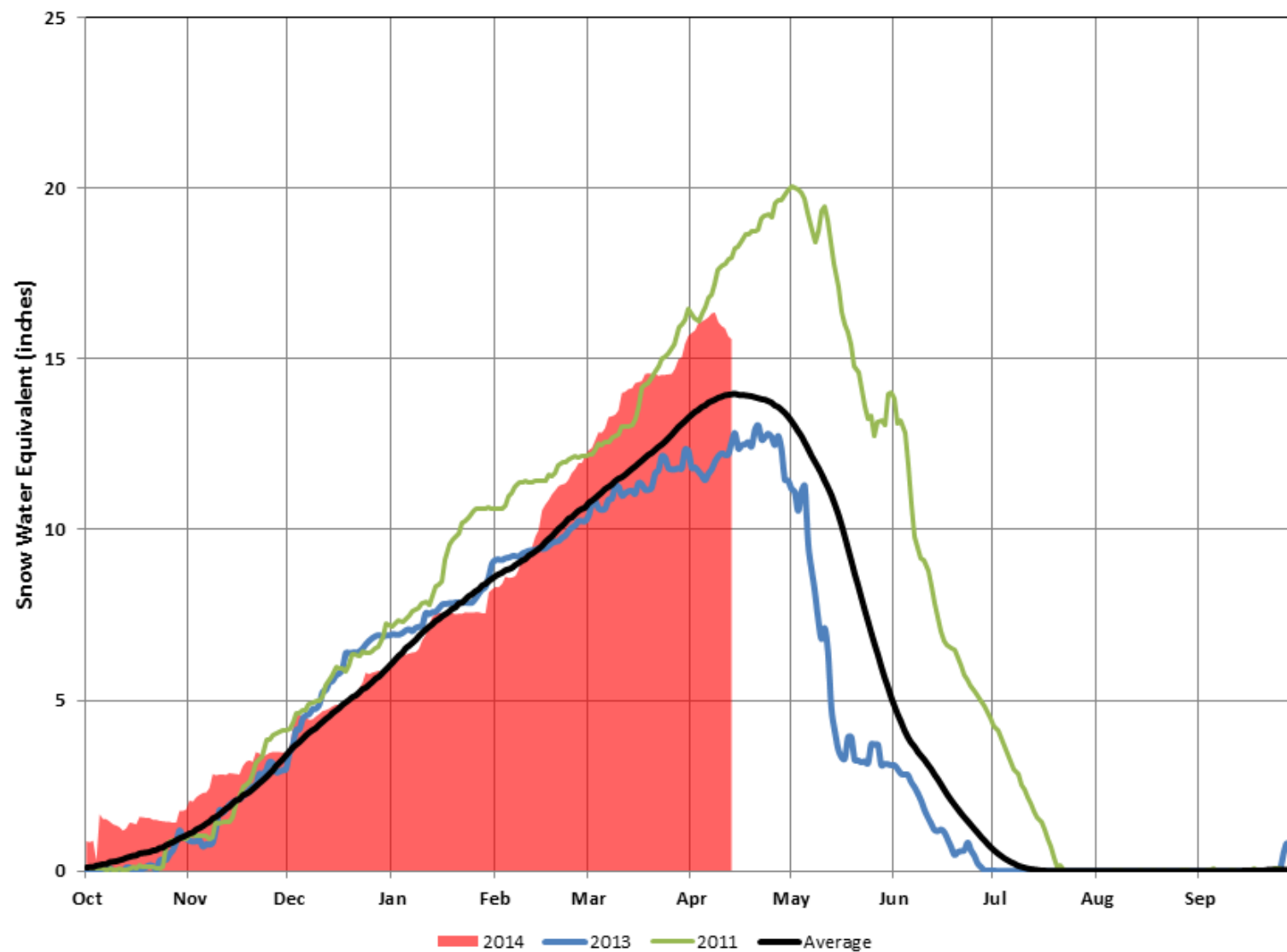
# Lima Reservoir Operations



# RECLAMATION

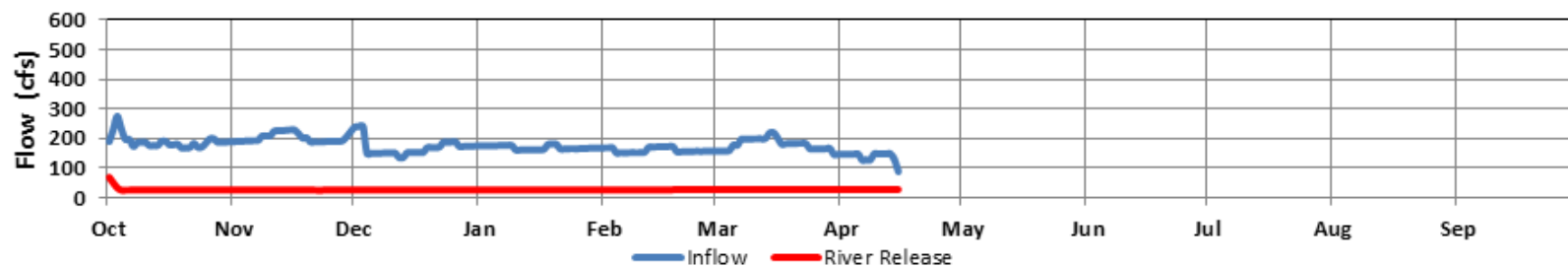
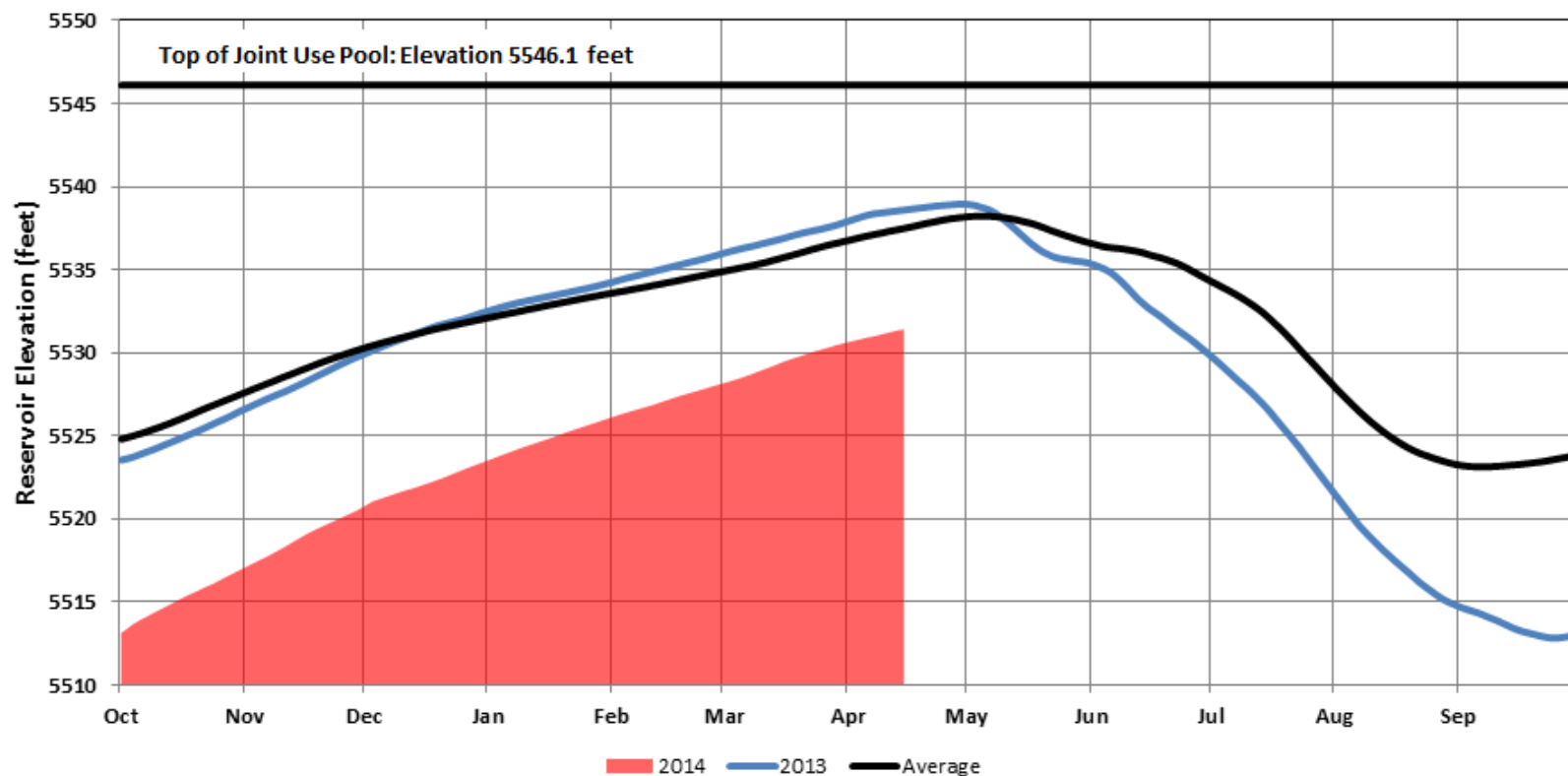


## Snowpack above Clark Canyon Reservoir



# RECLAMATION

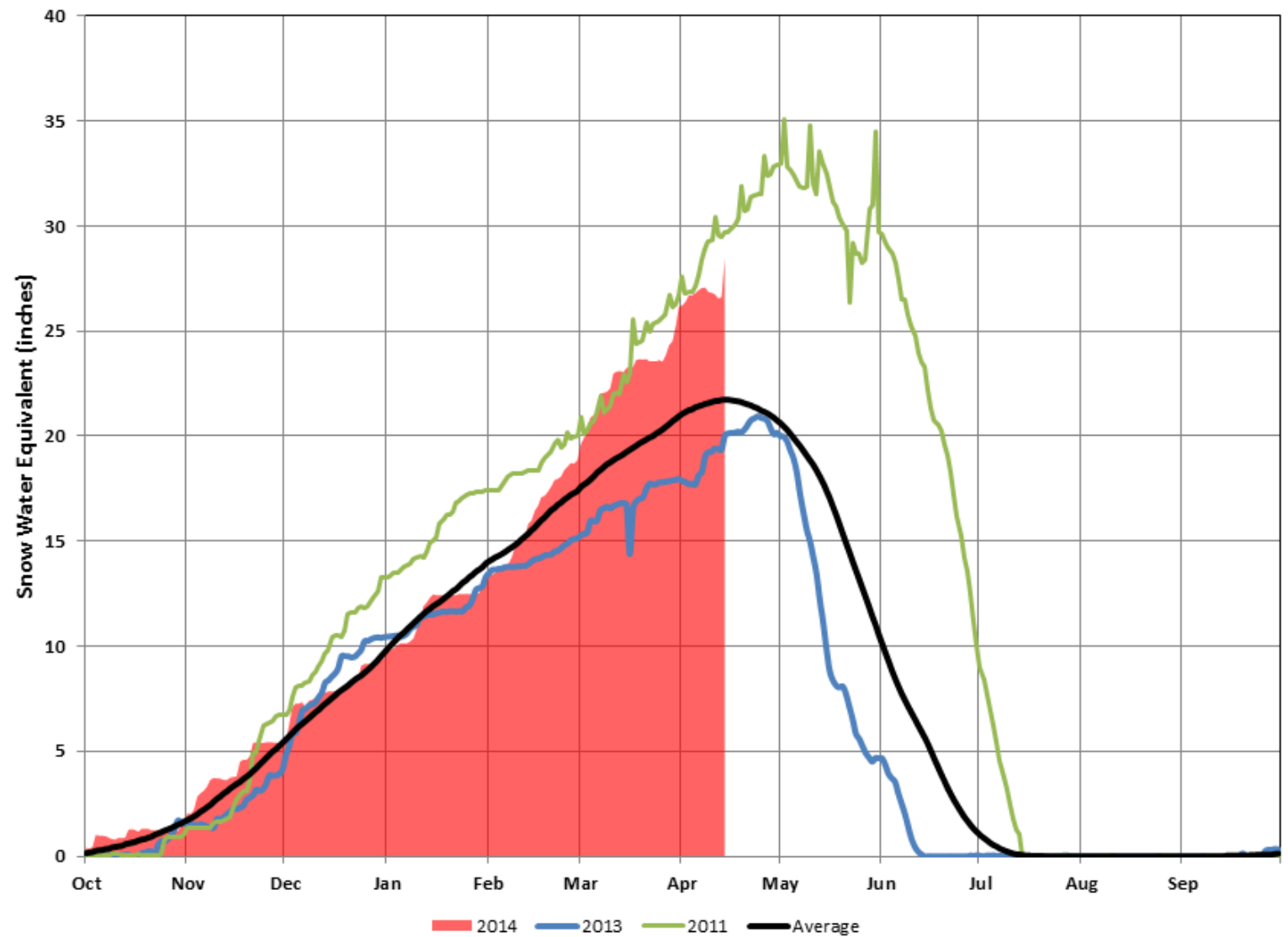
## Clark Canyon Reservoir Operations



# RECLAMATION

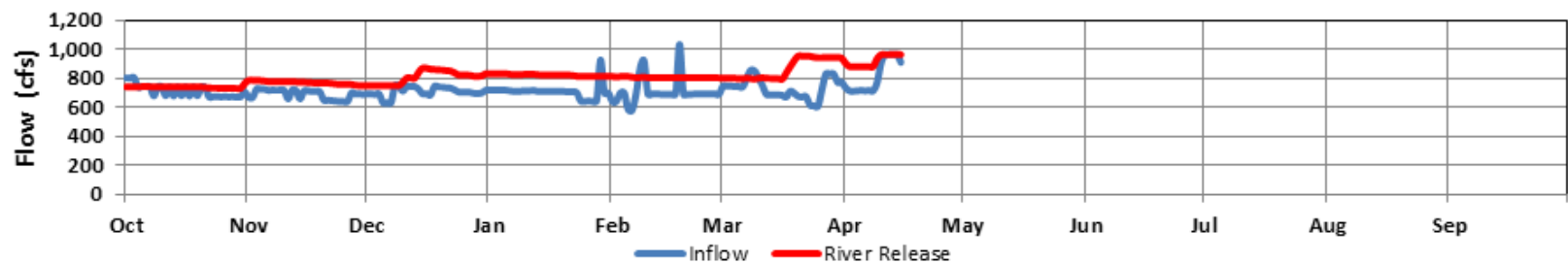
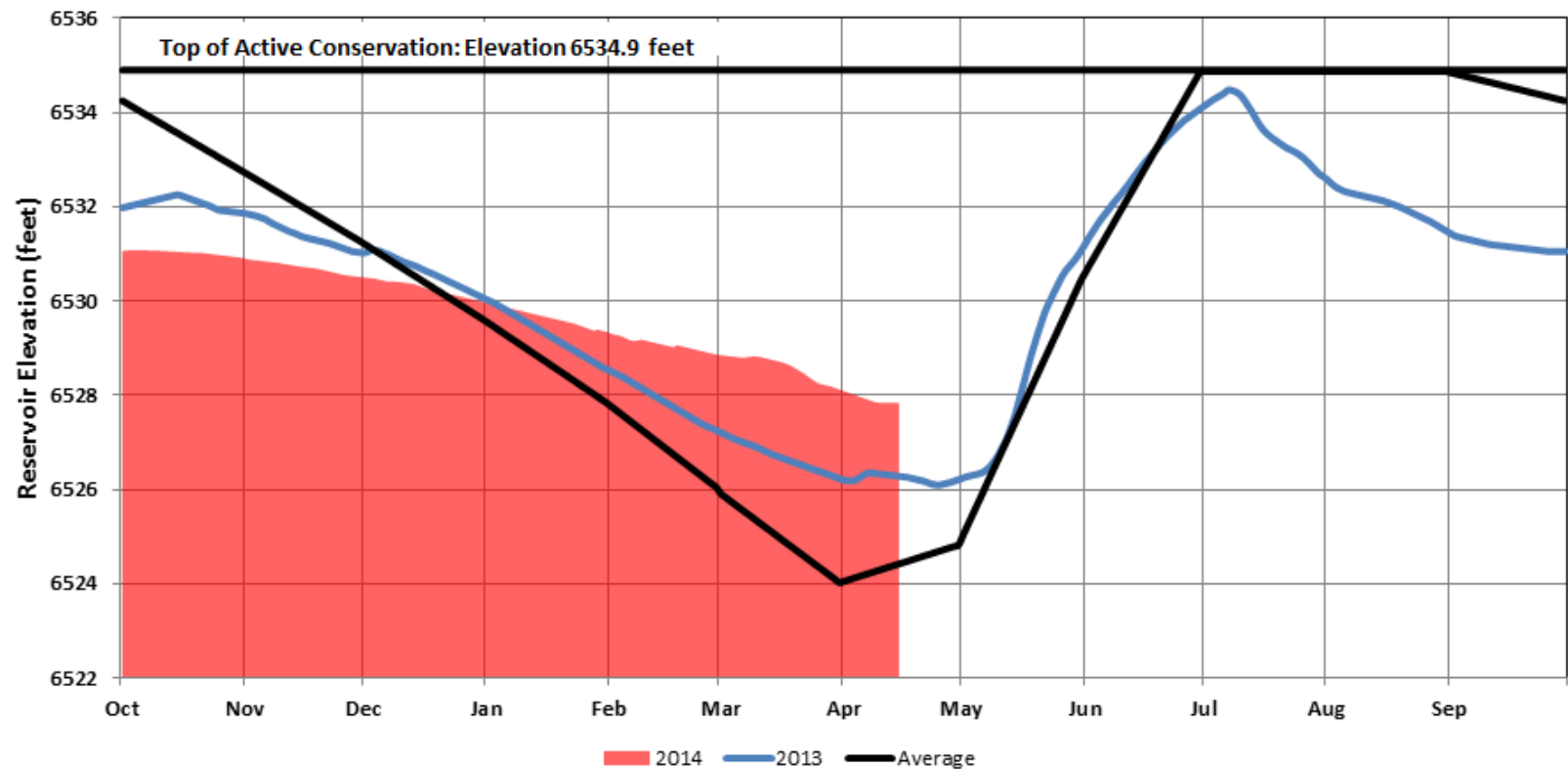


## Snowpack above Hebgen Reservoir



# RECLAMATION

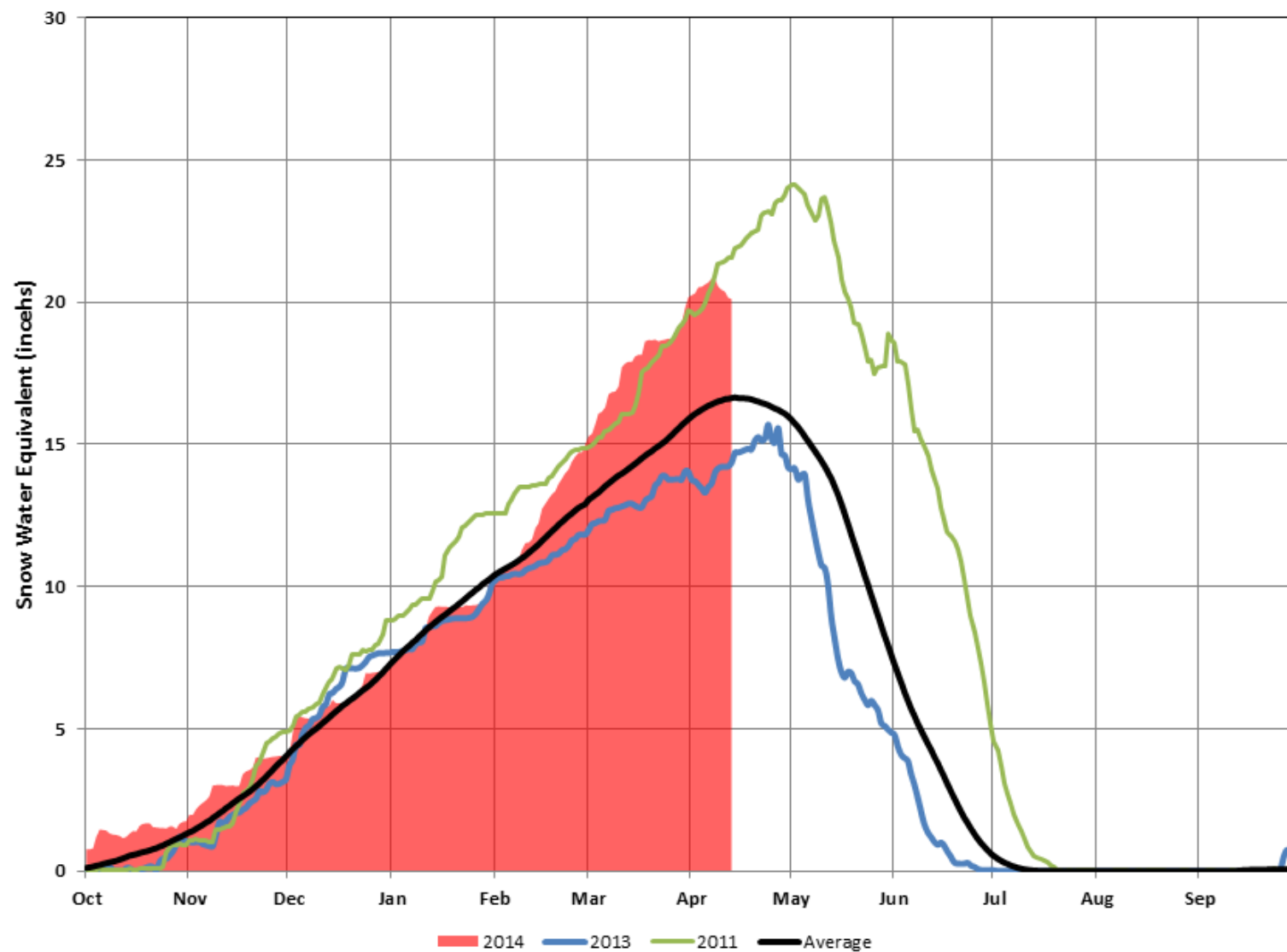
# Hebgen Reservoir Operations



# RECLAMATION

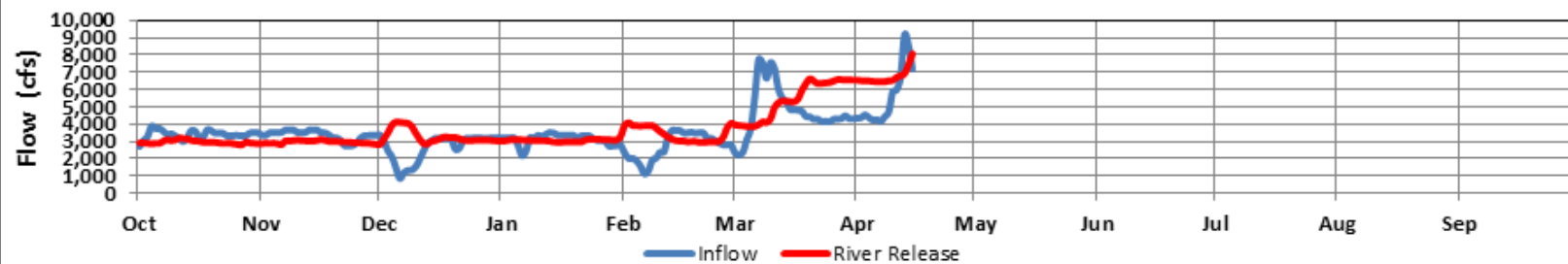
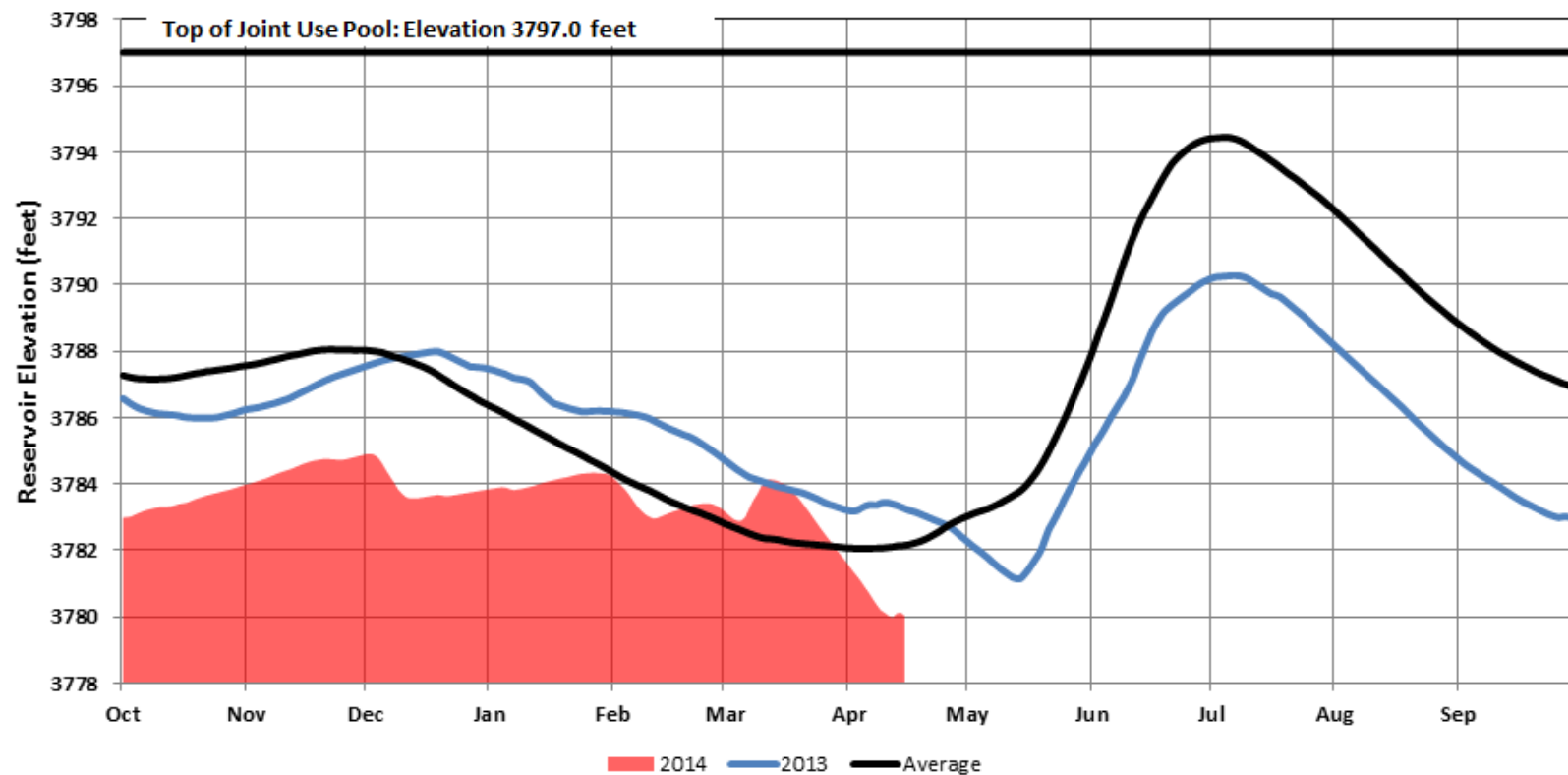


## Snowpack above Canyon Ferry Reservoir



RECLAMATION

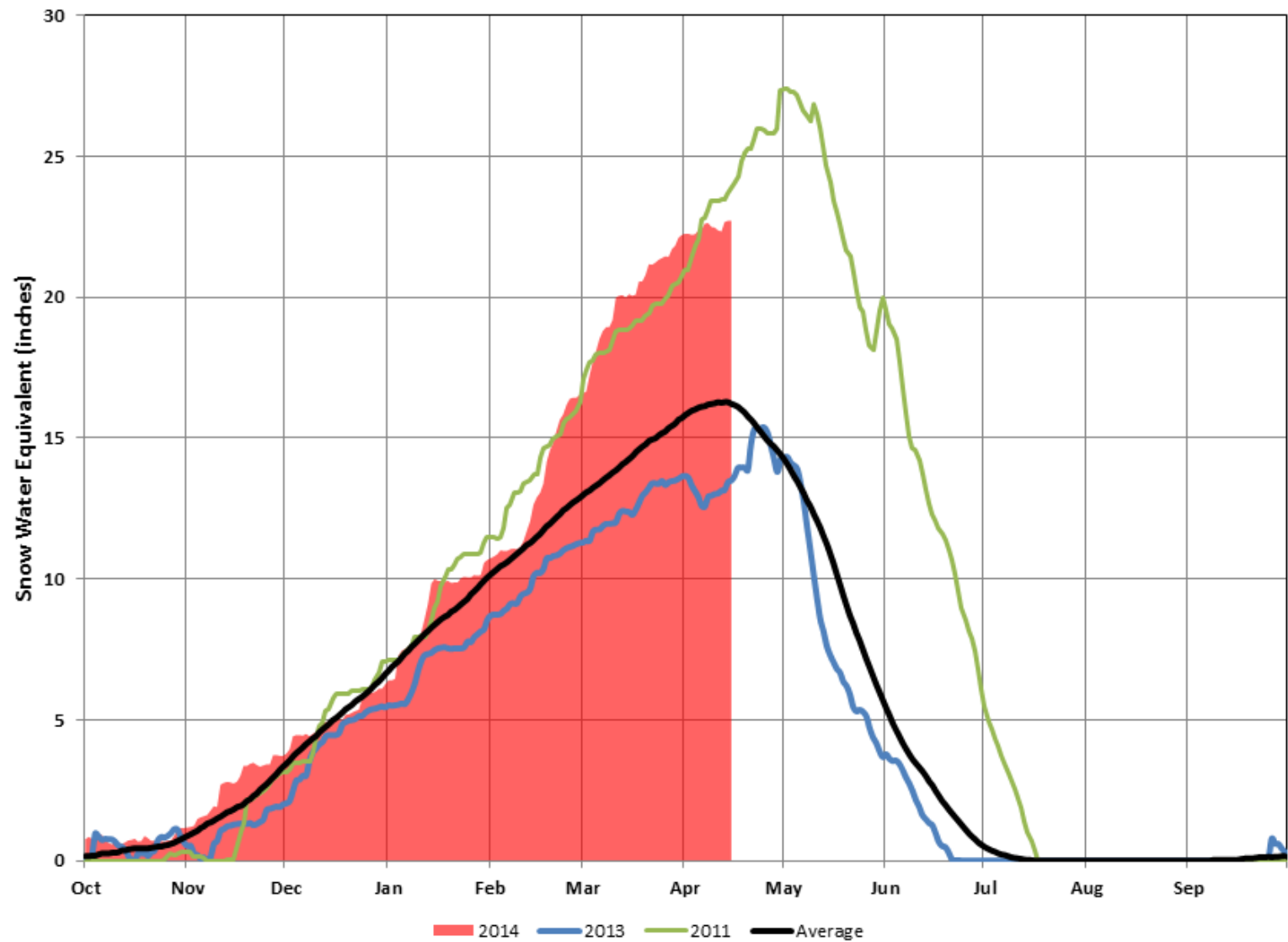
# Canyon Ferry Reservoir Operations



# RECLAMATION

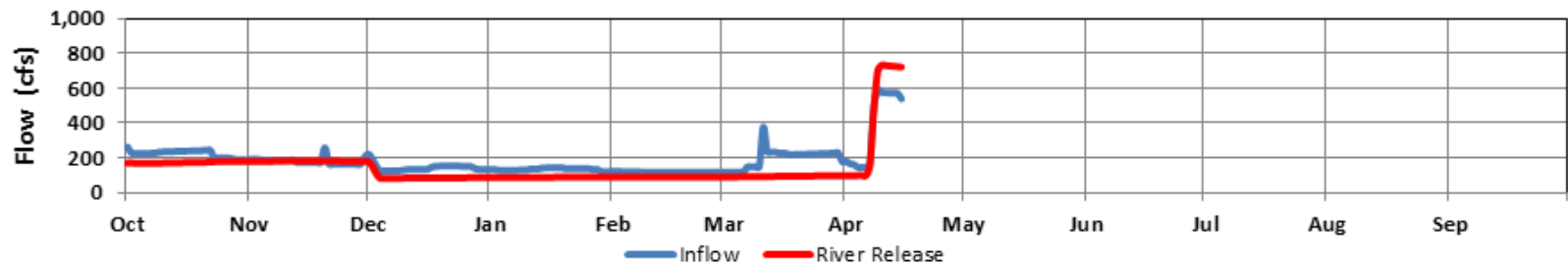
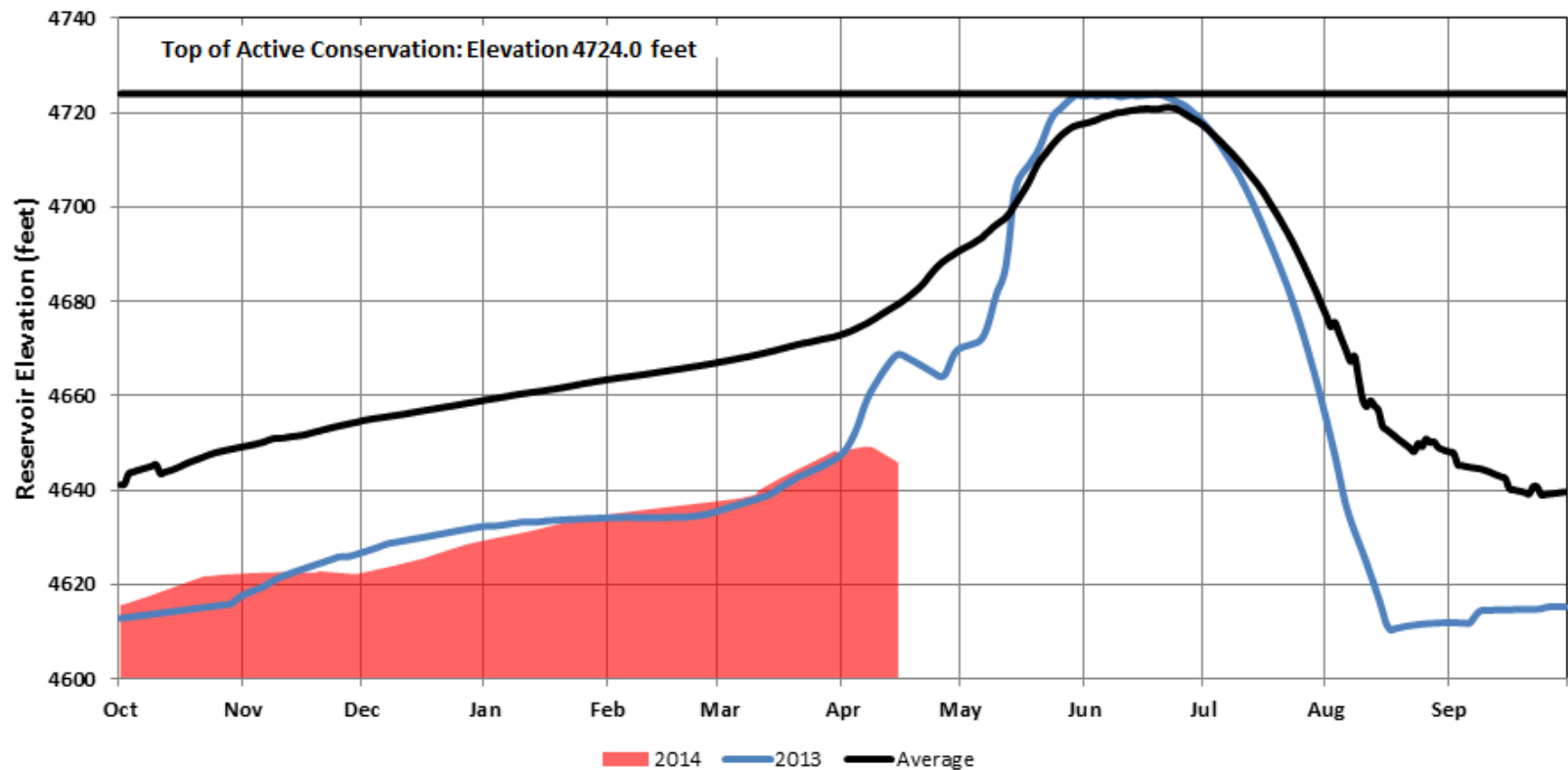


## Snowpack above Gibson Reservoir



# RECLAMATION

# Gibson Reservoir Operations

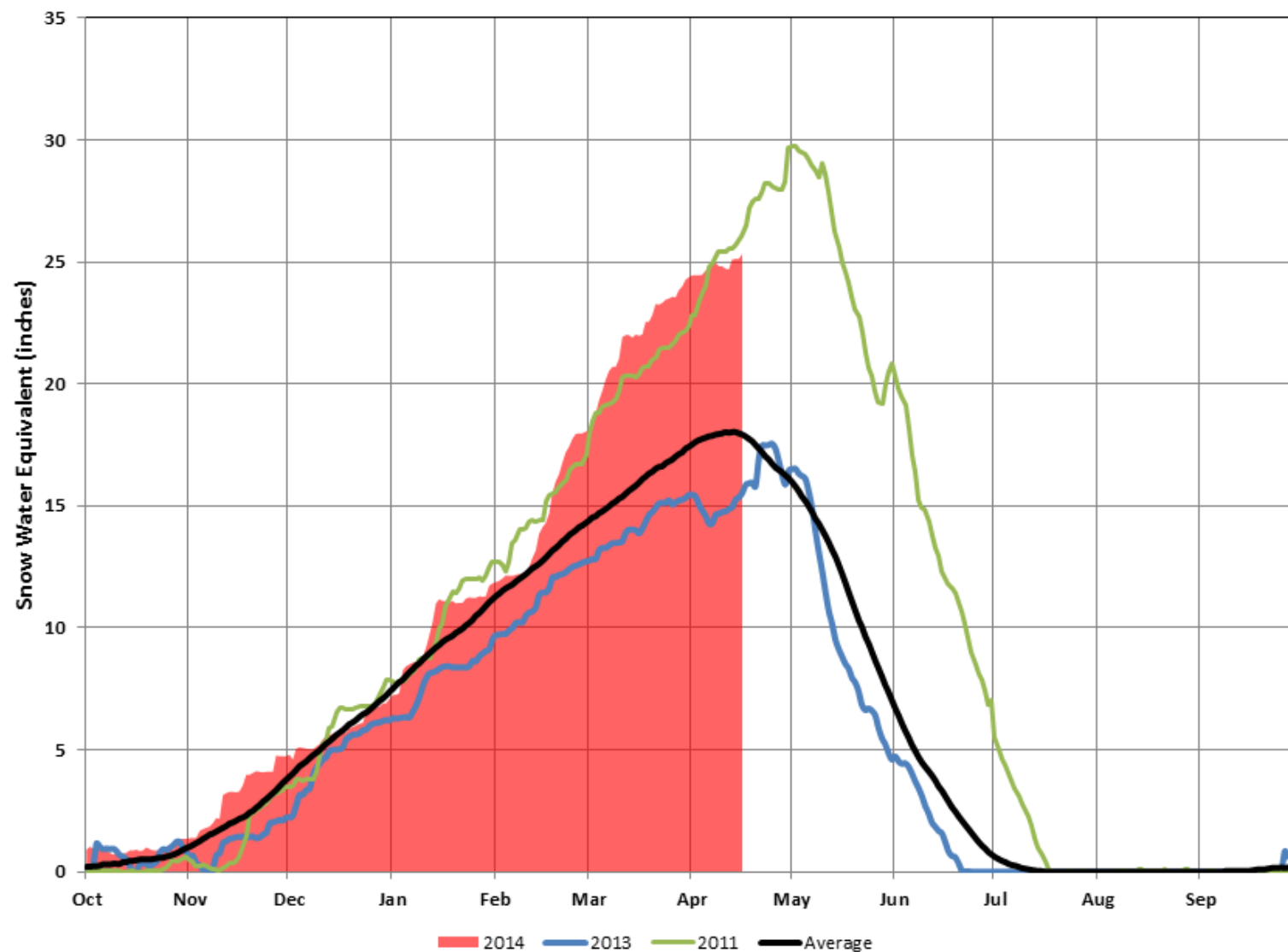


# RECLAMATION



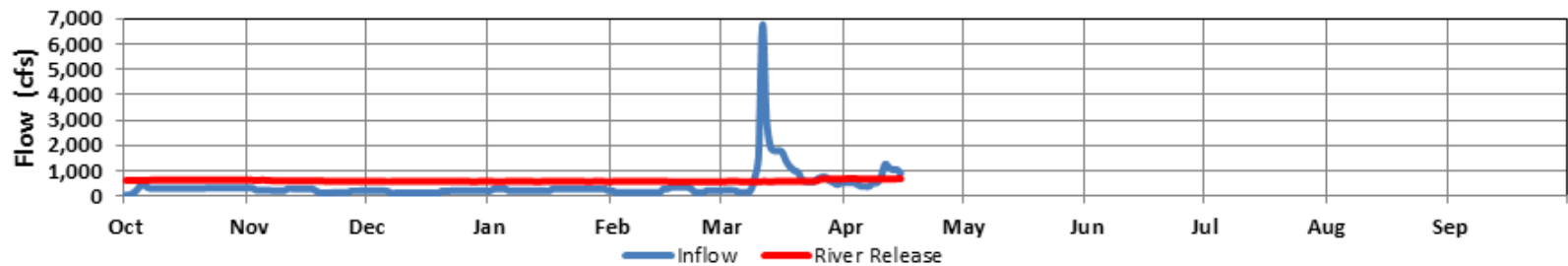
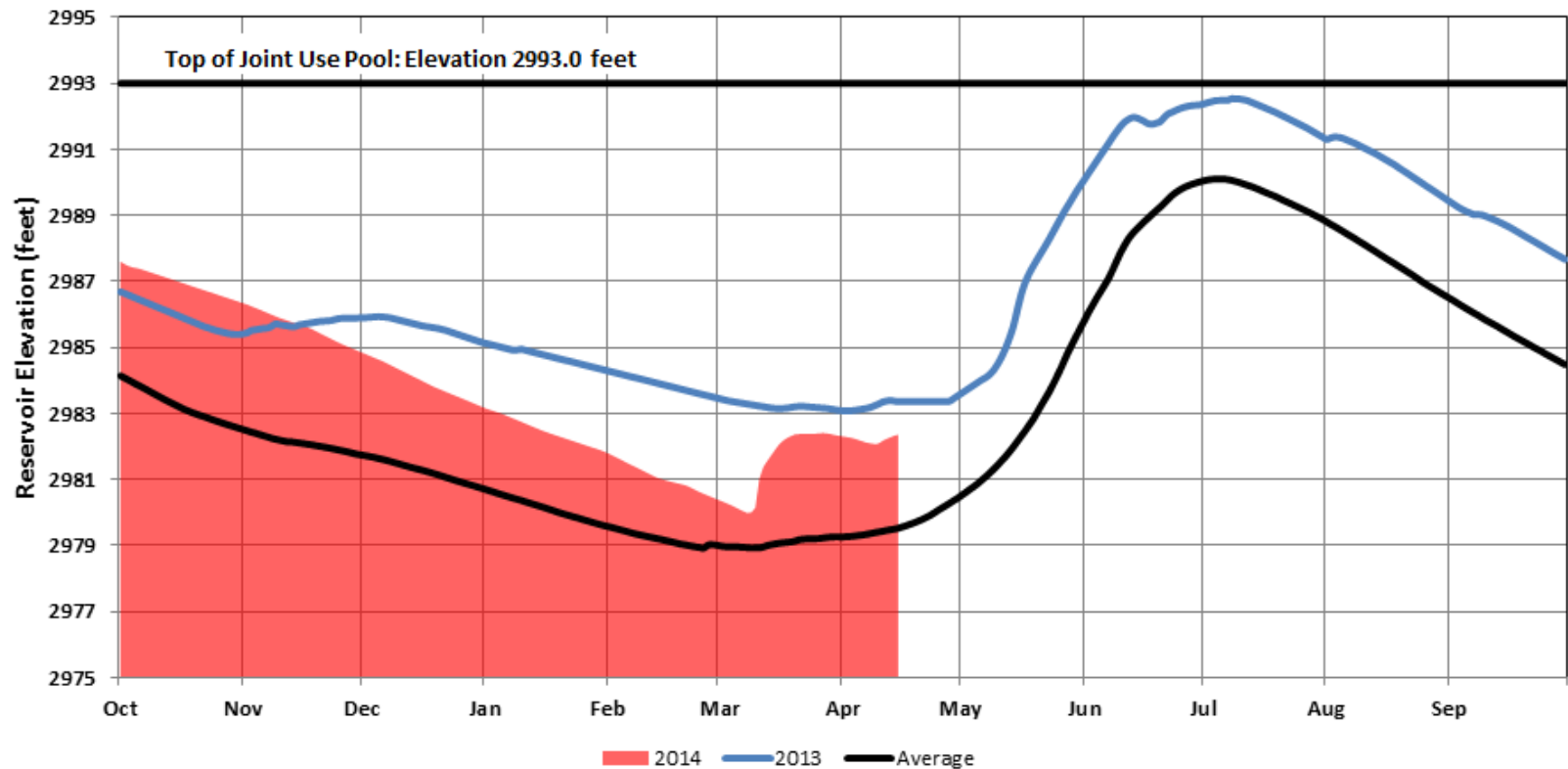


## Snowpack above Lake Elwell



# RECLAMATION

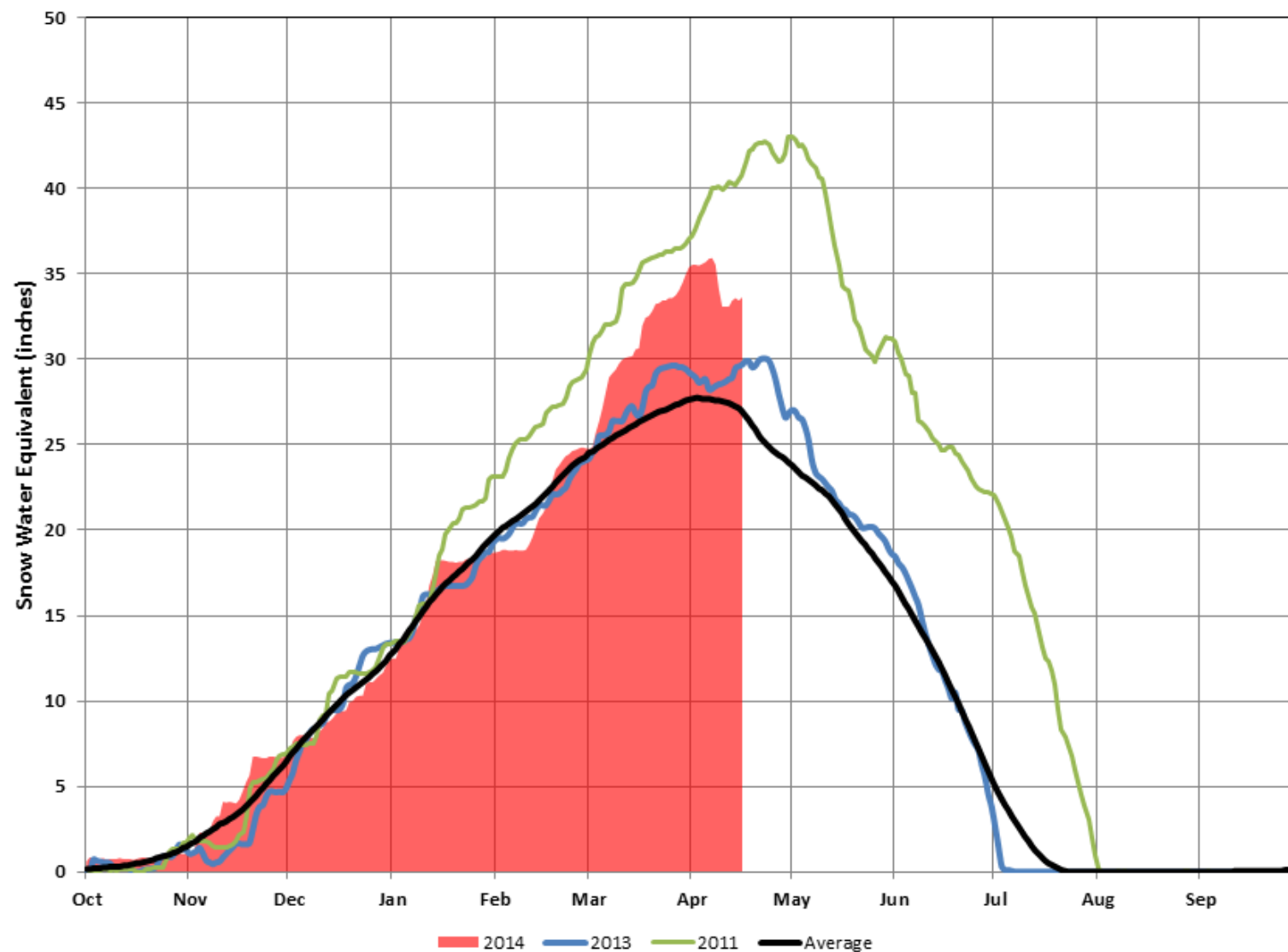
# Lake Elwell (Tiber Dam) Operations



# RECLAMATION

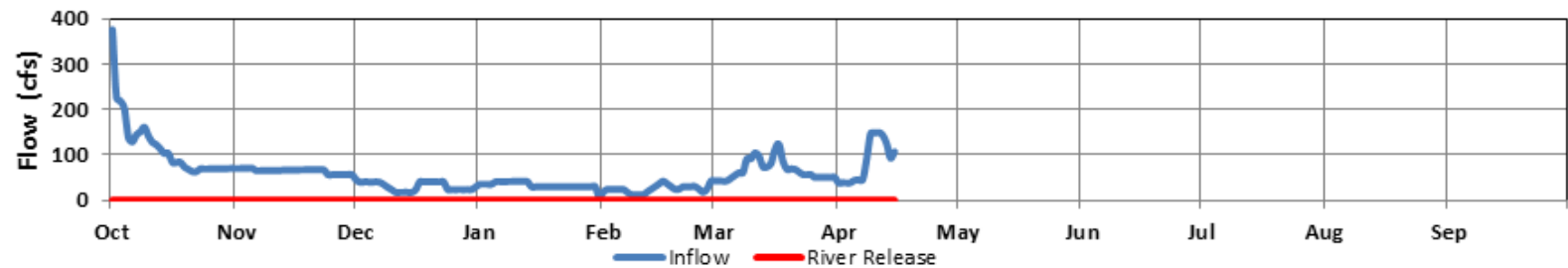
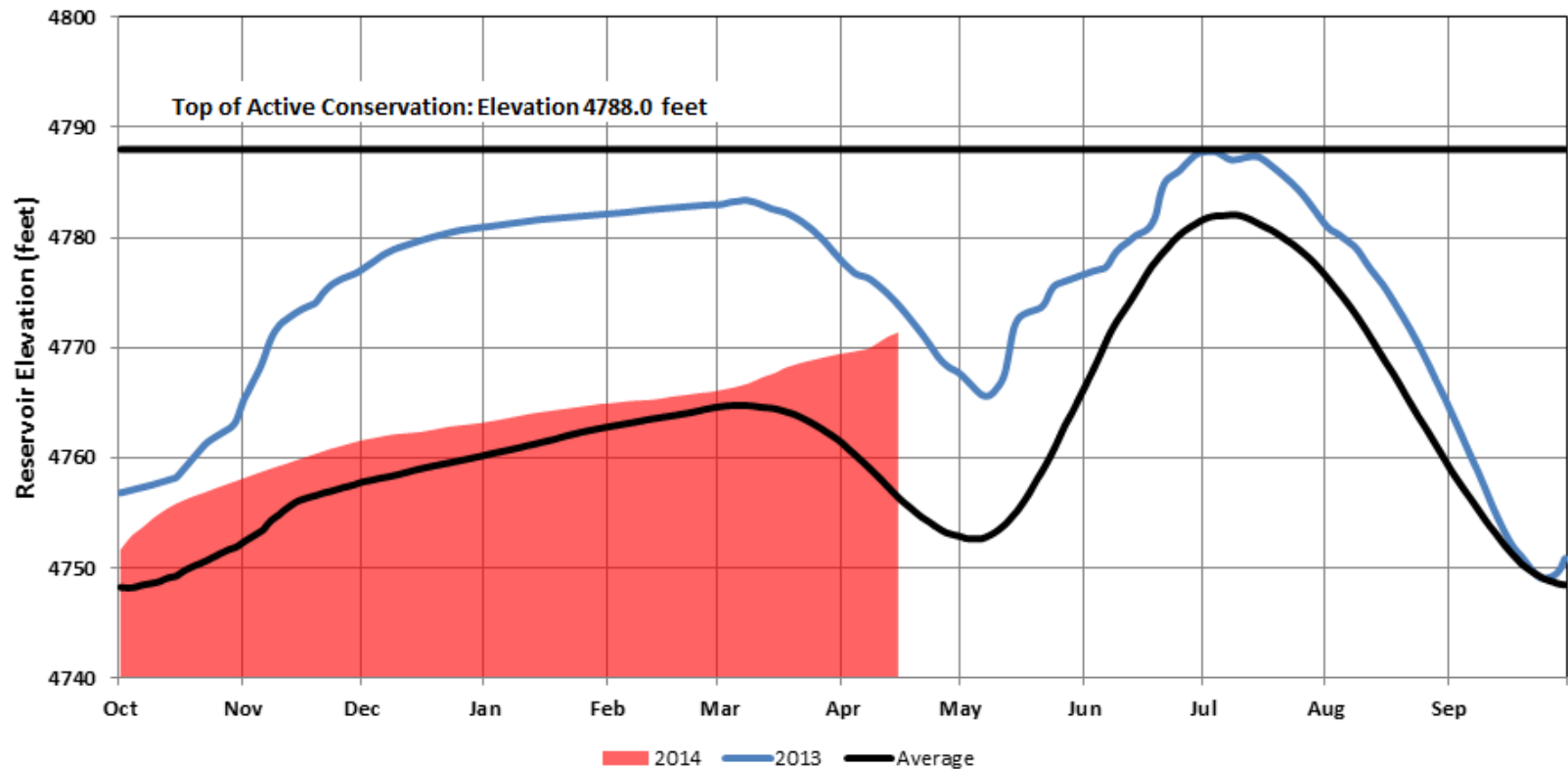


## Snowpack above Lake Sherburne



# RECLAMATION

# Lake Sherburne Operations

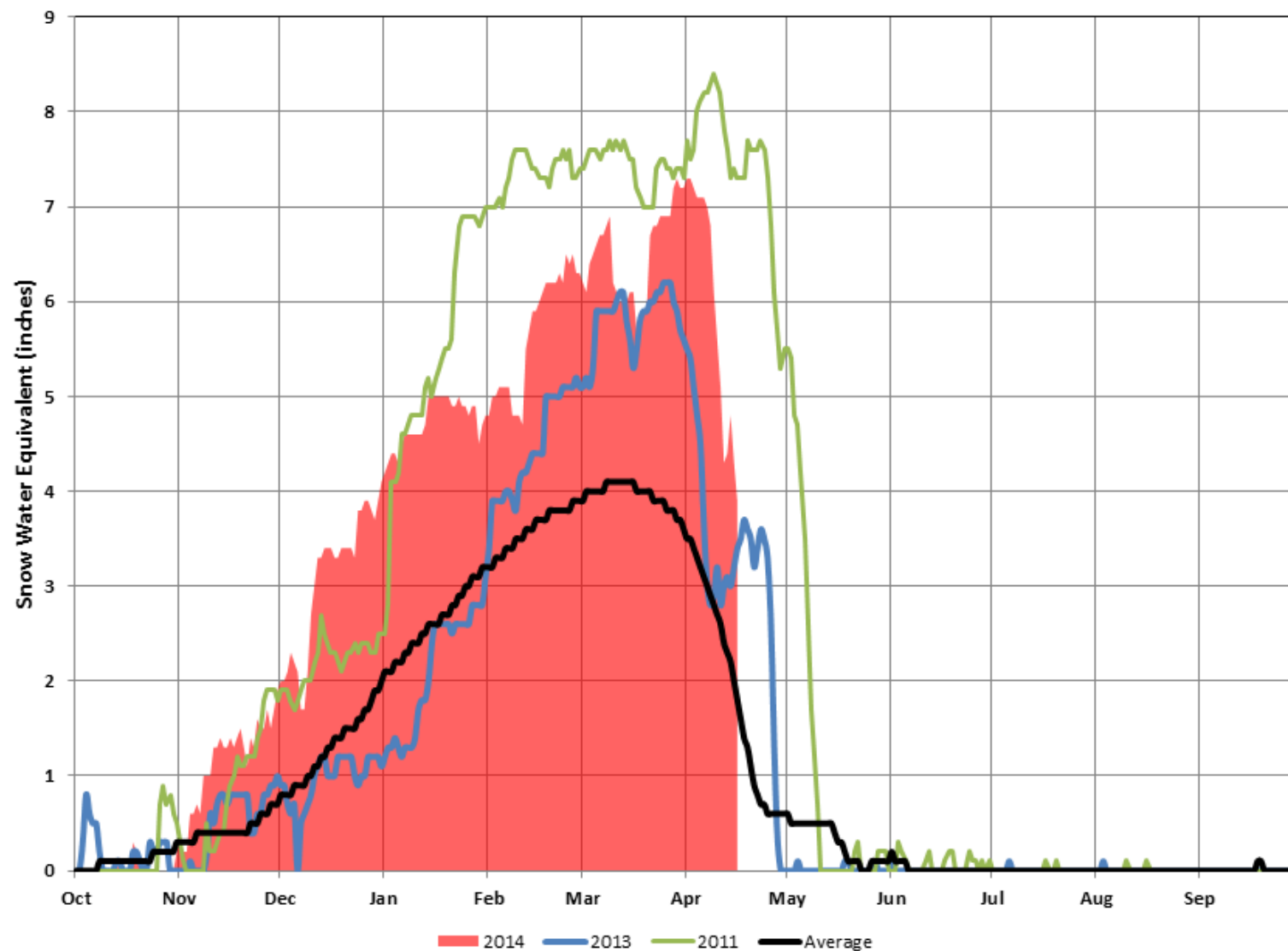


# RECLAMATION



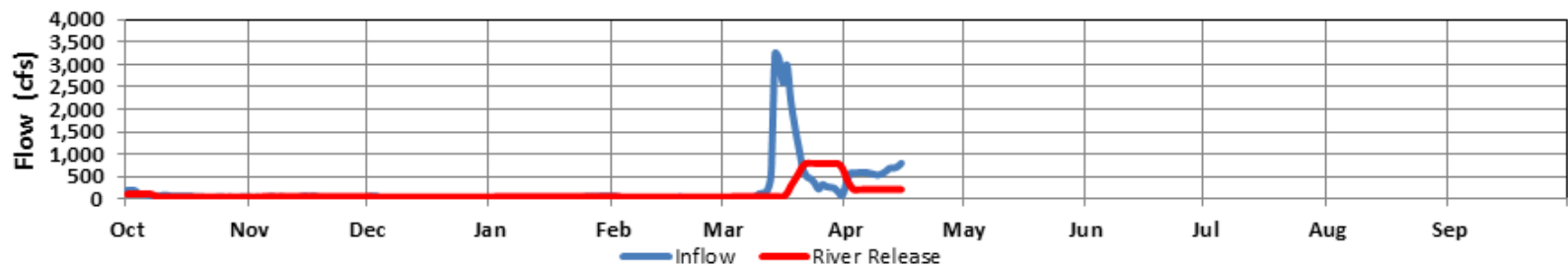
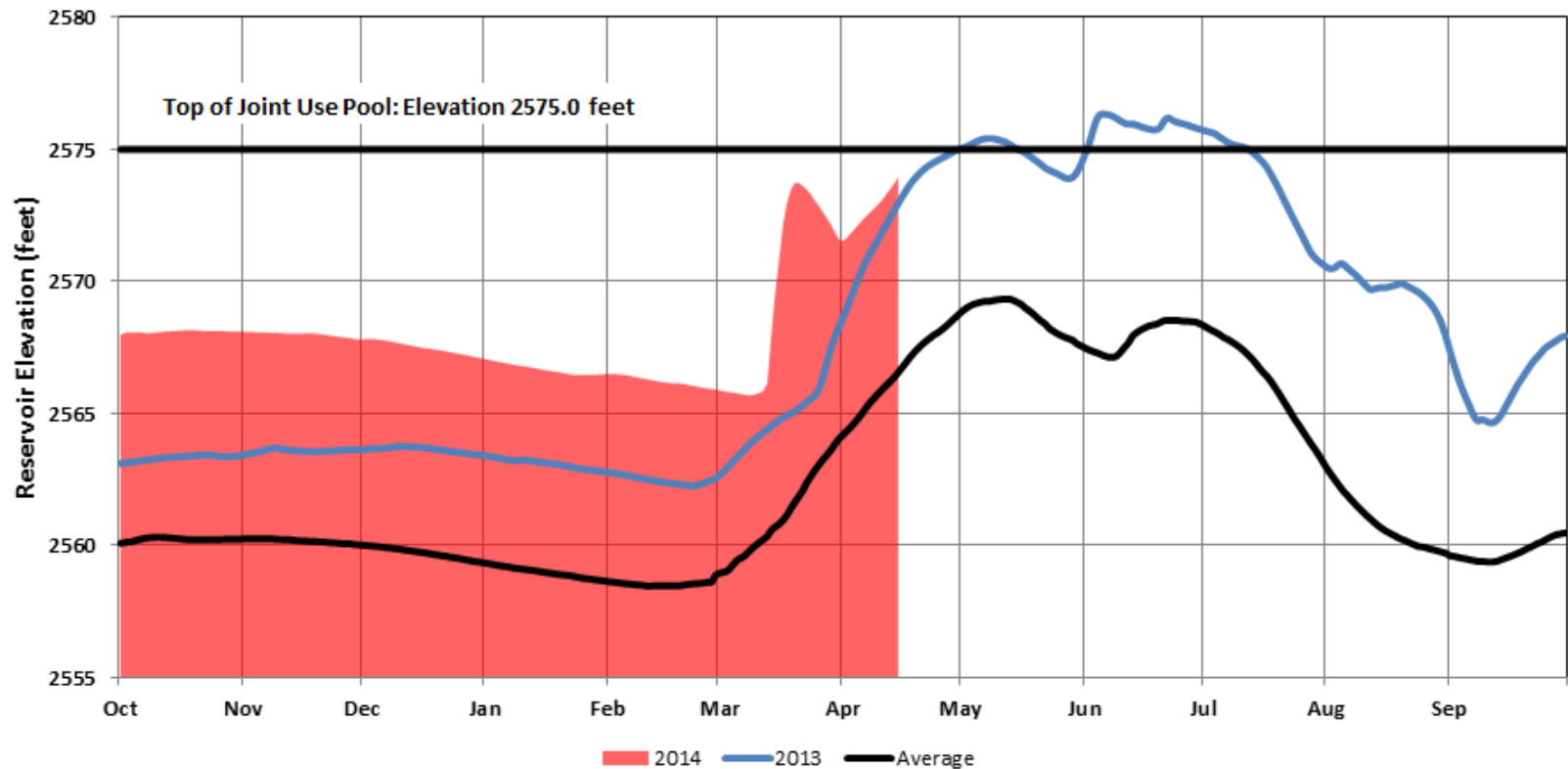


## Snowpack above Fresno Reservoir



# RECLAMATION

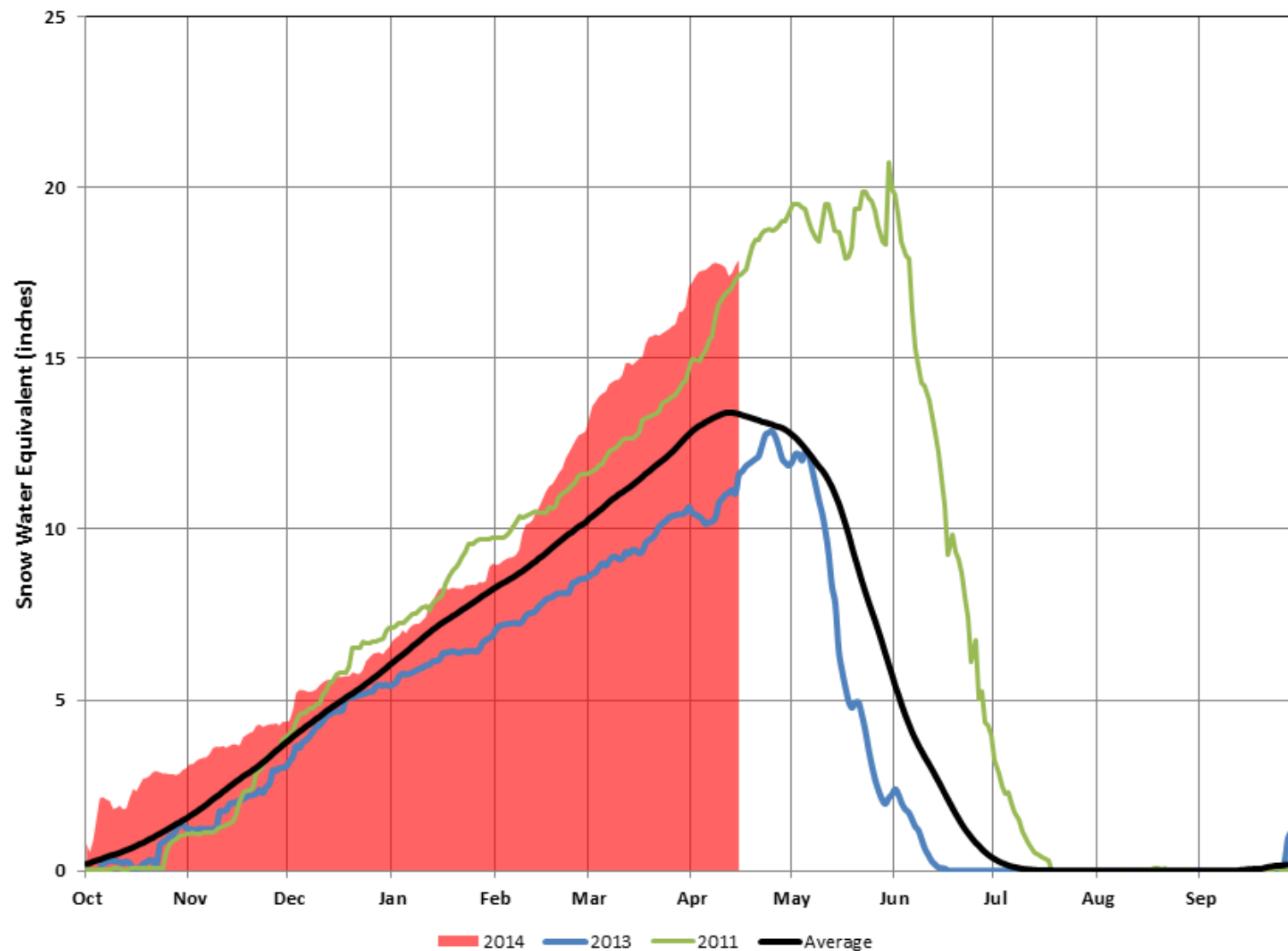
# Fresno Reservoir Operations



# RECLAMATION

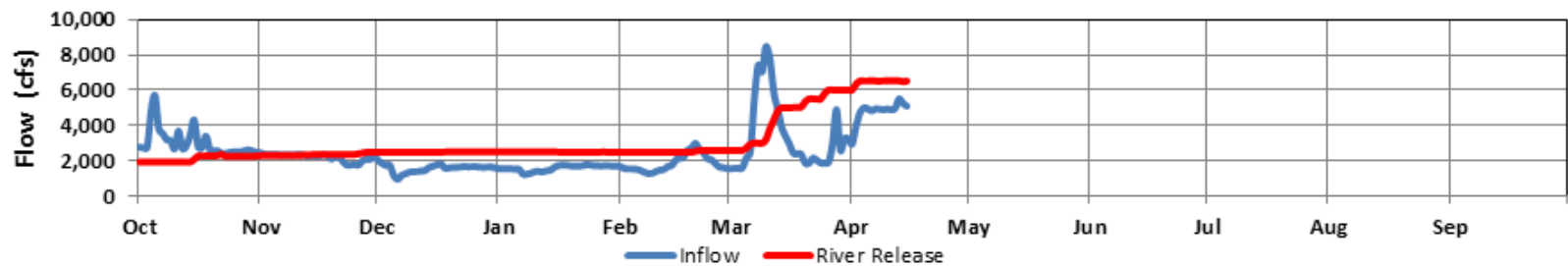
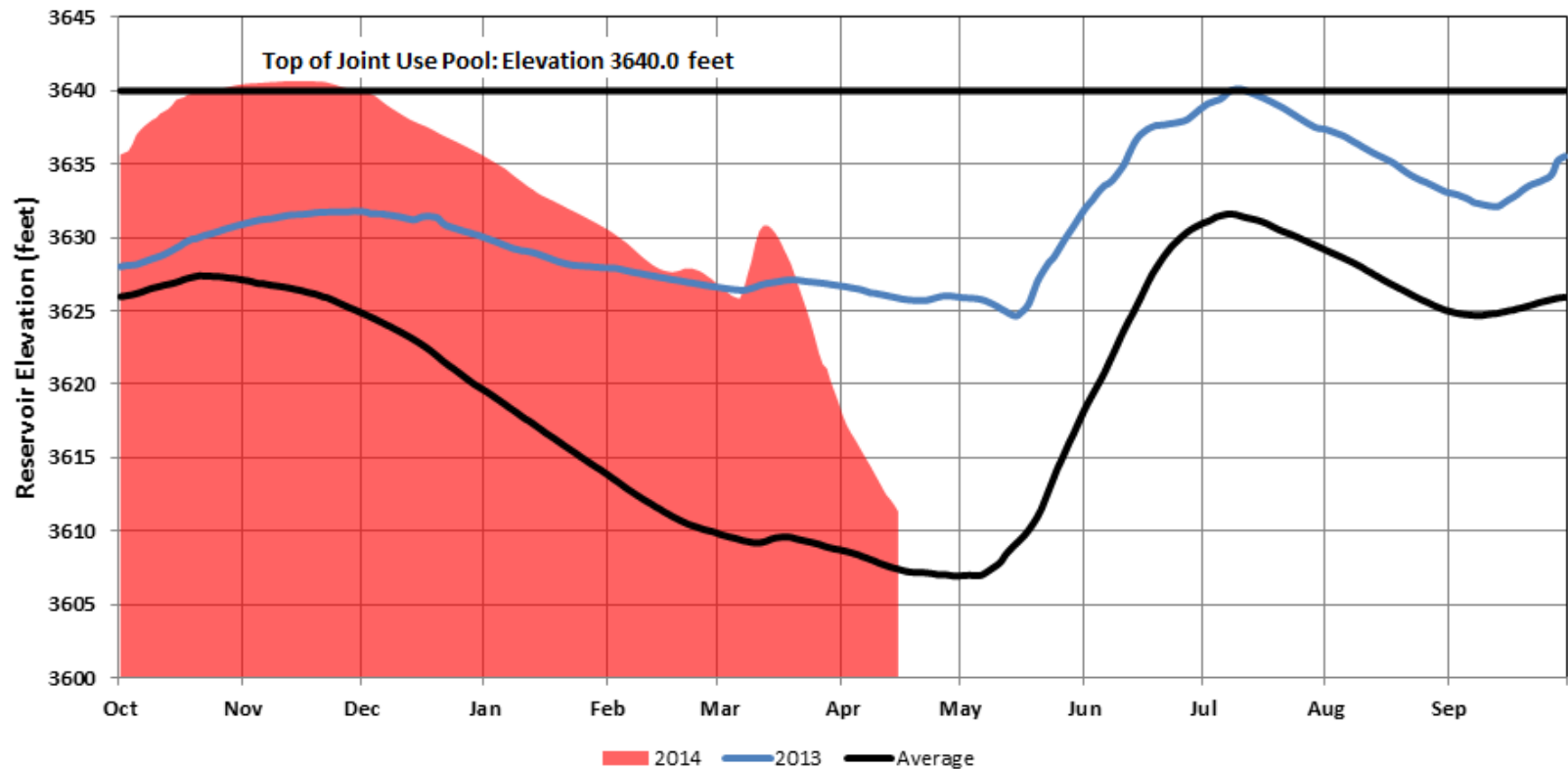


## Snowpack above Bighorn Lake



RECLAMATION

# Bighorn Lake (Yellowtail Dam) Operations

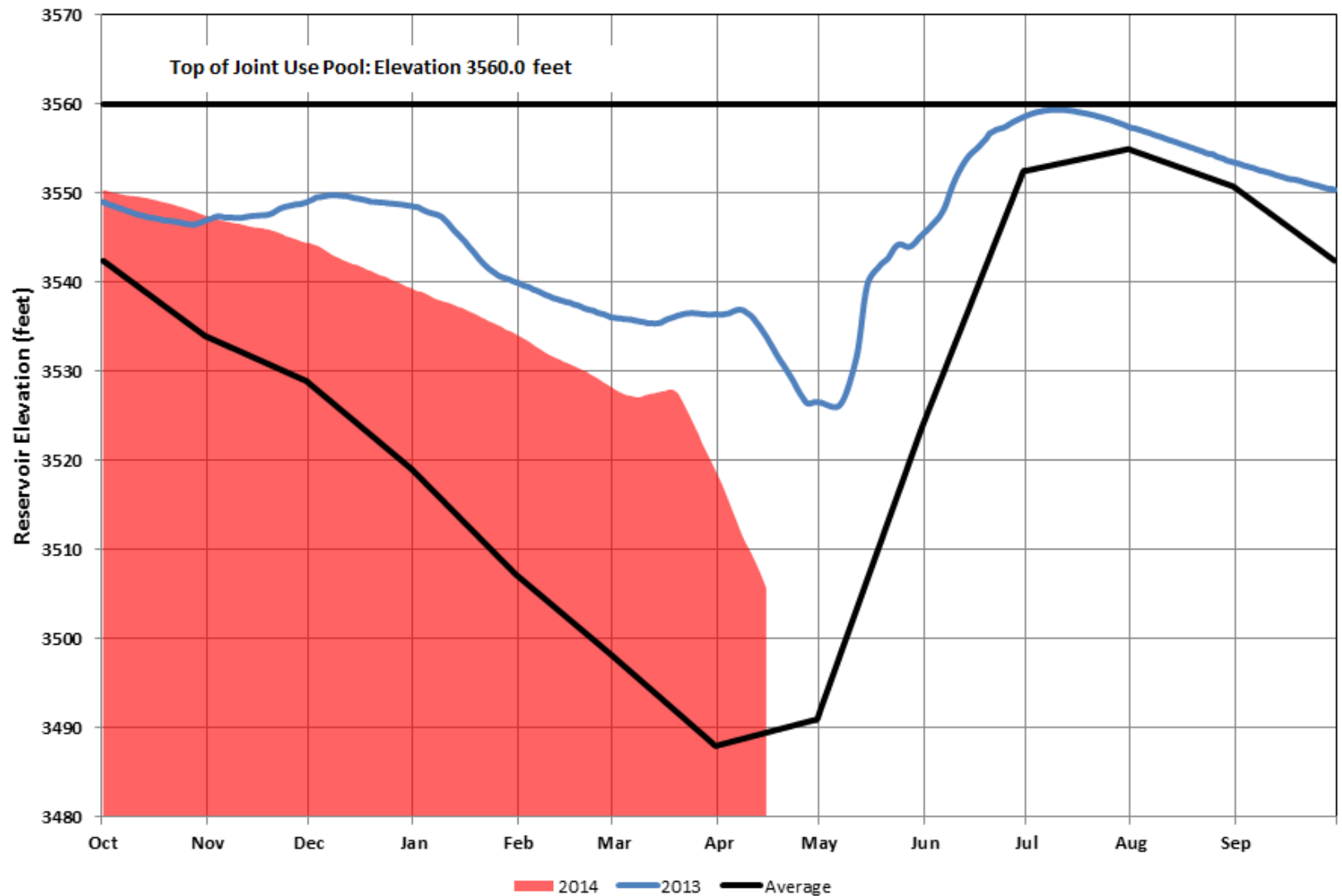


# RECLAMATION





## Hungry Horse Reservoir Operations



# RECLAMATION



# Summary of Reservoir Conditions

- **Snowpack conditions in all other river basins are well above average and near record levels.**
- **Water supply outlook for all of Reclamation water users looks good.**
- **At this time, many of Reclamation's reservoirs are being positioned to provide the maximum amount of flood protection possible this year because of the unusually high snowpack across Montana and Wyoming.**
- **Due to the warm temperatures last week, inflows picked up a bit and with the recent cooler temperatures, they have once again dropped off.**
- **Reclamation continues to monitor hydrologic and climatic conditions closely and is prepared to make necessary changes as needed.**

RECLAMATION

# Reclamation's Internet Website

<http://www.usbr.gov/gp/water/>

- near real-time data available through the HYDROMET data system
- summaries and plots of historical data
- annual reservoir operating plan publication
- monthly water supply reports
- project data
- snow plots
- links to related internet sites

RECLAMATION

# Reservoir Storage Outlook

April 17, 2014



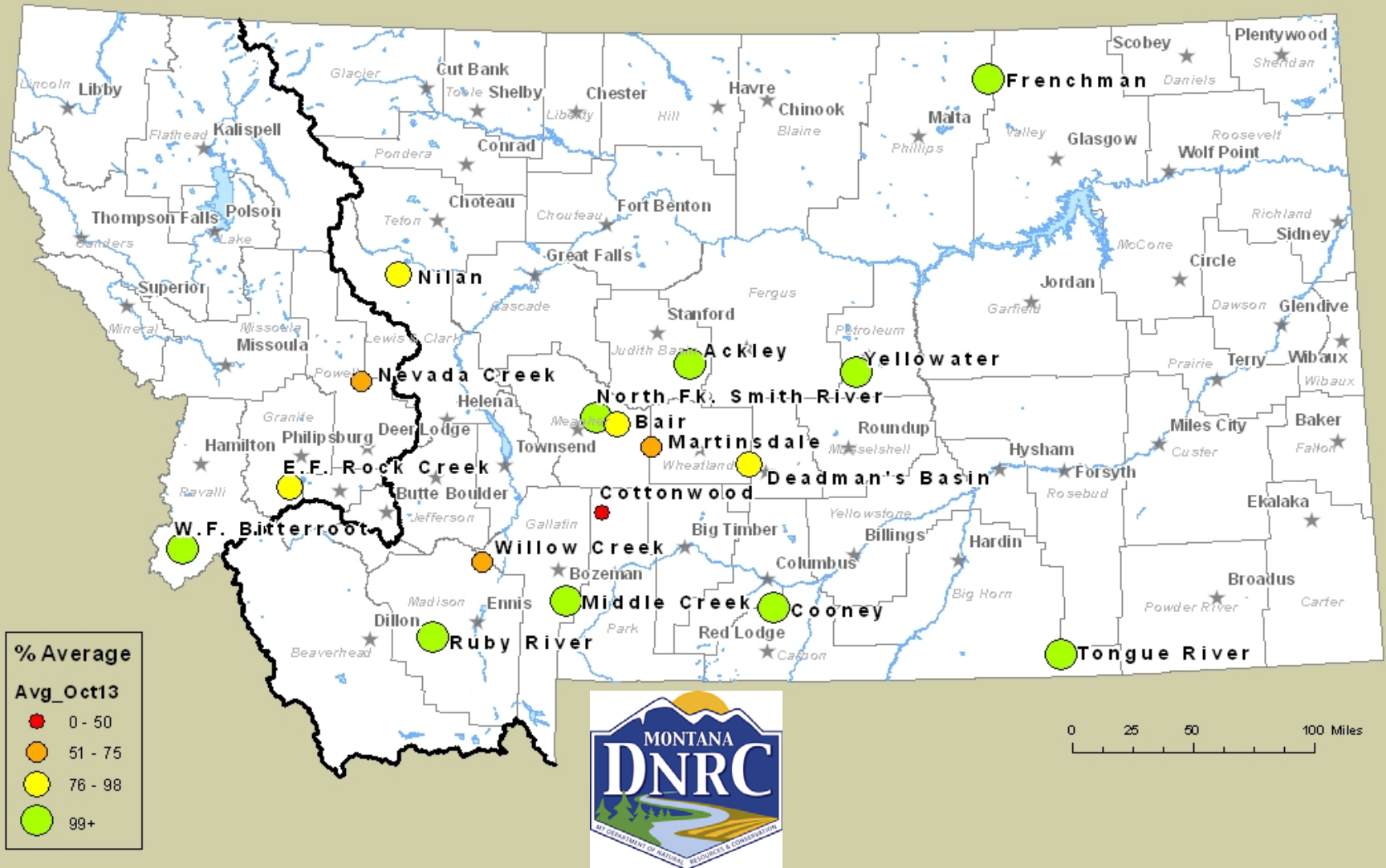
DNRC Water Resources Division  
State Water Projects Bureau



# Montana DNRC State Water Projects Bureau Reservoirs

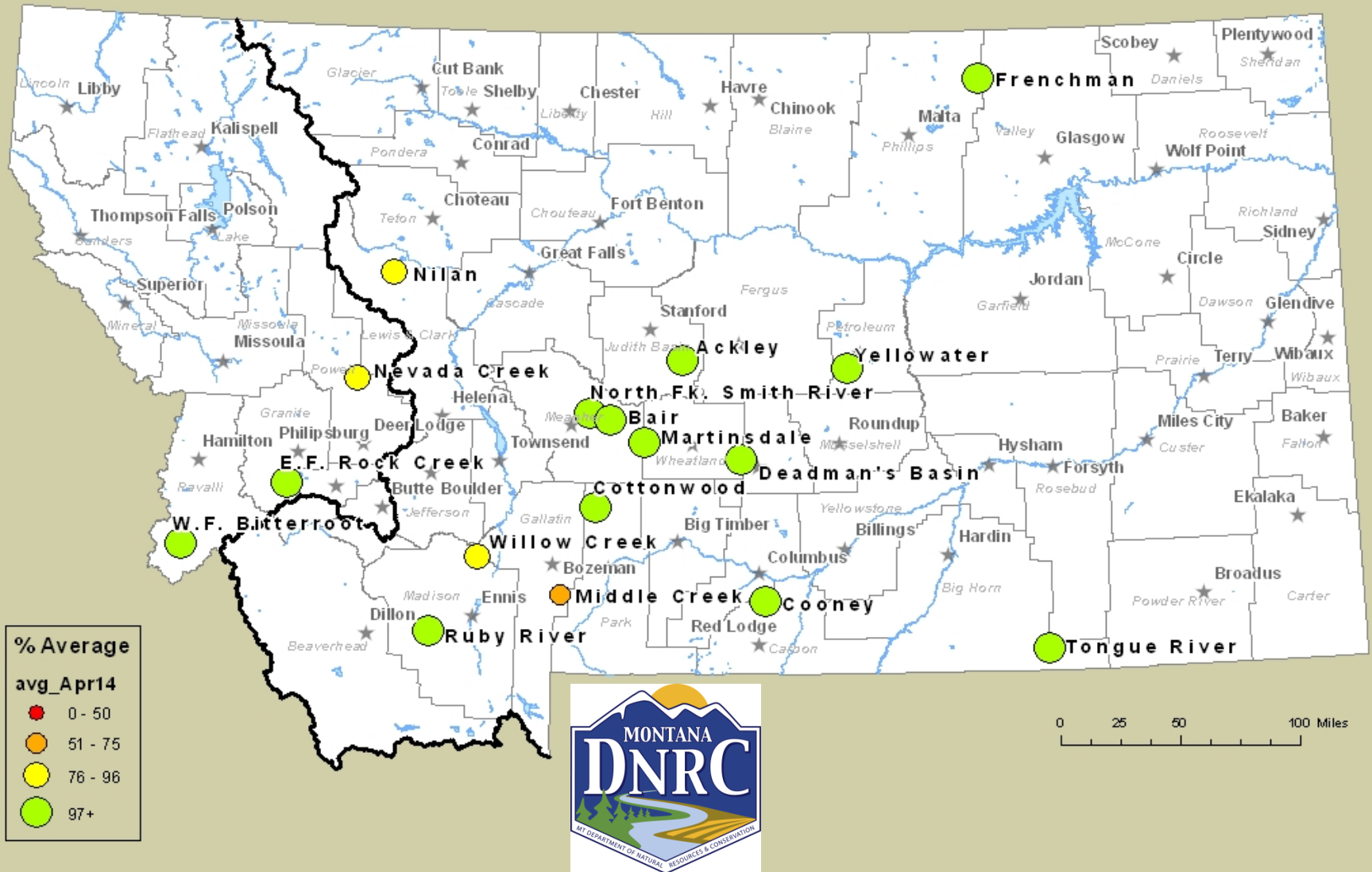


# Reservoir Contents Report October 25, 2013



# Reservoir Contents Report

## April 17, 2014





# MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

WATER RESOURCES DIVISION - STATE WATER PROJECTS BUREAU

**March 31, 2014**

All Contents in Acre-Feet

RESERVOIR	TOTAL CAPACITY (includes dead storage)*	CONTENTS				% CAPACITY	%AVERAGE	READING DATE	COMMENTS
		AVERAGE	Last Year	Last Month	PRESENT				
		1960 - 2013	3/31/2013	2/28/2014	3/31/2014				
	Full Pool								
	Contents								
ACKLEY	6,722	3,210	2,946	3,586	4,153	62	129	4/3/2014	elev.=4307.0
BAIR	7,300	4,384	4,520	3,230	3,773	52	86	4/1/2014	elev.=5308.74
COONEY	28,230	20,895	19,088	19,286	21,461	76	103	3/31/2014	elev.=4242.71 (21,371 AF)
COTTONWOOD	1,900	969	614	500	1,596	84	165	4/4/2014	elev.=5101.11
DEADMAN'S BASIN	75,968	49,115	54,837	47,439	56,444	74	115	3/31/2014	elev.=3911.1 (52,694)
E.F. ROCK CREEK	16,040	9,587	10,247	9,261	9,720	61	101	3/31/2014	elev.=6037.6
FRENCHMAN	2,777	2,156	2,777	2,777	2,777	100	129	3/31/2014	elev.=2264.6
MARTINDALE	23,348	9,169	6,904	5,521	7,344	31	80	4/1/2014	elev.=4757.56
MIDDLE CREEK	10,184	6,163	4,847	4,808	4,499	44	73	3/31/2014	elev.=6690.4
NEVADA CREEK	11,207	7,845	6,325	4,119	6,521	58	83	4/1/2014	elev.=4601.77
NILAN	10,992	6,713	6,055	5,759	6,391	58	95	4/1/2014	elev.=4432.45 (5,491 AF)
N.F.K. SMITH RIVER	11,406	7,061	7,491	6,700	8,148	71	115	4/1/2014	volume estimated
RUBY RIVER	37,612	31,155	31,741	32,300	34,501	92	111	4/1/2014	elev.=5389.78
TONGUE RIVER	79,071	49,395	54,037	55,004	60,558	77	123	3/31/2014	elev.=3423.0
W.F. BITTERROOT	32,362	9,032	12,338	10,424	14,125	44	156	3/26/2014	elev.=4689.1
WILLOW CREEK	18,000	16,366	14,388	18,000	16,183	90	99	4/6/2014	elev.=4733.72
YELLOWWATER	3,842	1,250	1,732	2,940	3,496	91	280	4/2/2014	elev.=3117.7

\* Note: Reservoir contents include dead storage at the following:

Ackley	1001 AF	**	** O&M slope storage table does not include dead storage (so dead storage has to be added into the storage from the table)
Cooney	90 AF	**	Tongue River 711 AF (O&M storage table includes dead storage)
Deadman's	3750 AF	**	W. F. Bitterroot 656 AF (O&M storage table includes dead storage)
Nilan	900 AF	**	Willow Creek 269 AF (O&M storage table includes dead storage)

\* Note: Cooney capacity reflects capacity after 1982 dam rehabilitation; prior capacity was 24,195 A.F.. Average storage shown is for post rehabilitation data.

\* Note: Middle Creek capacity reflects capacity after 1993 dam rehabilitation; prior capacity was 8,027 A.F.. Average storage shown is for post rehabilitation data.

\* Note: Nevada Creek Reservoir Capacity reflects live storage capacity survey conducted in year 2000. Prior live storage capacity documented as 12,723 AF.

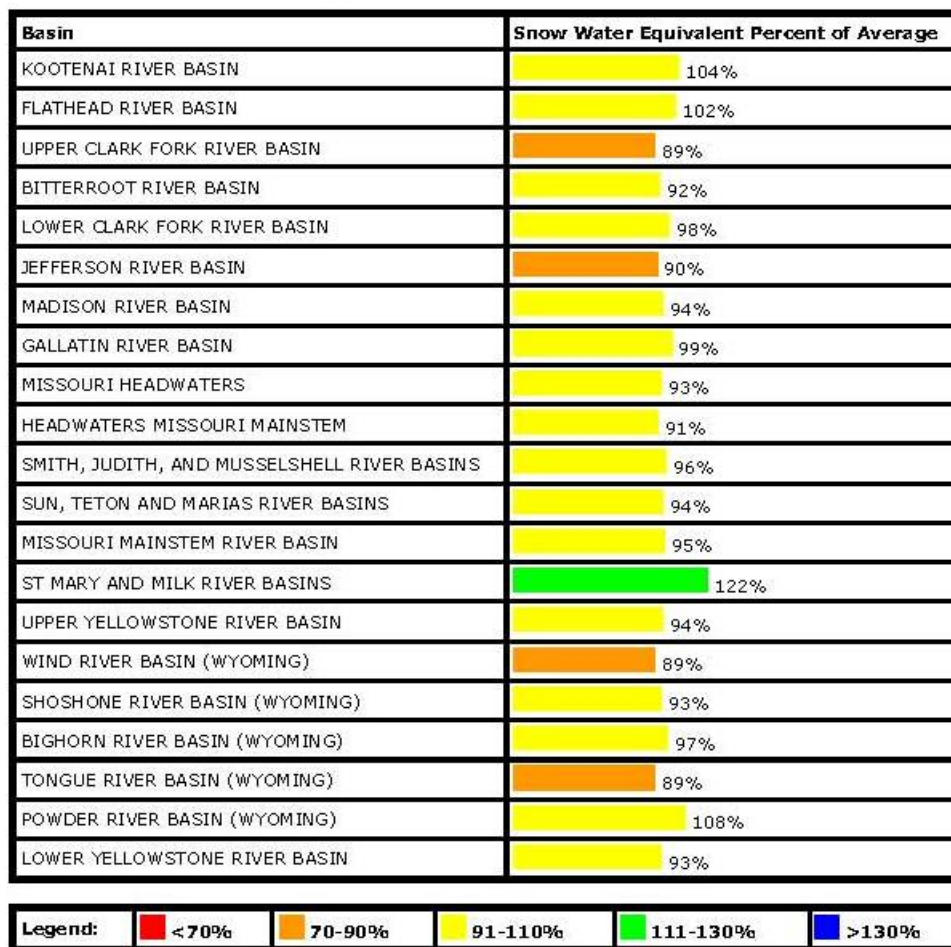
\* Note: Tongue River capacity reflects capacity after 1999 dam rehabilitation; prior capacity was 69,040 A.F.. Average storage is post rehabilitation data.

\* Note: Frenchman Reservoir capacity tables updated based on aerial survey; prior capacity was 3752 A.F. Average shown is pre aerial survey



## MONTANA SNOTEL Snow Water Equivalent Update Graph

As of **THURSDAY: APRIL 18 , 2013**

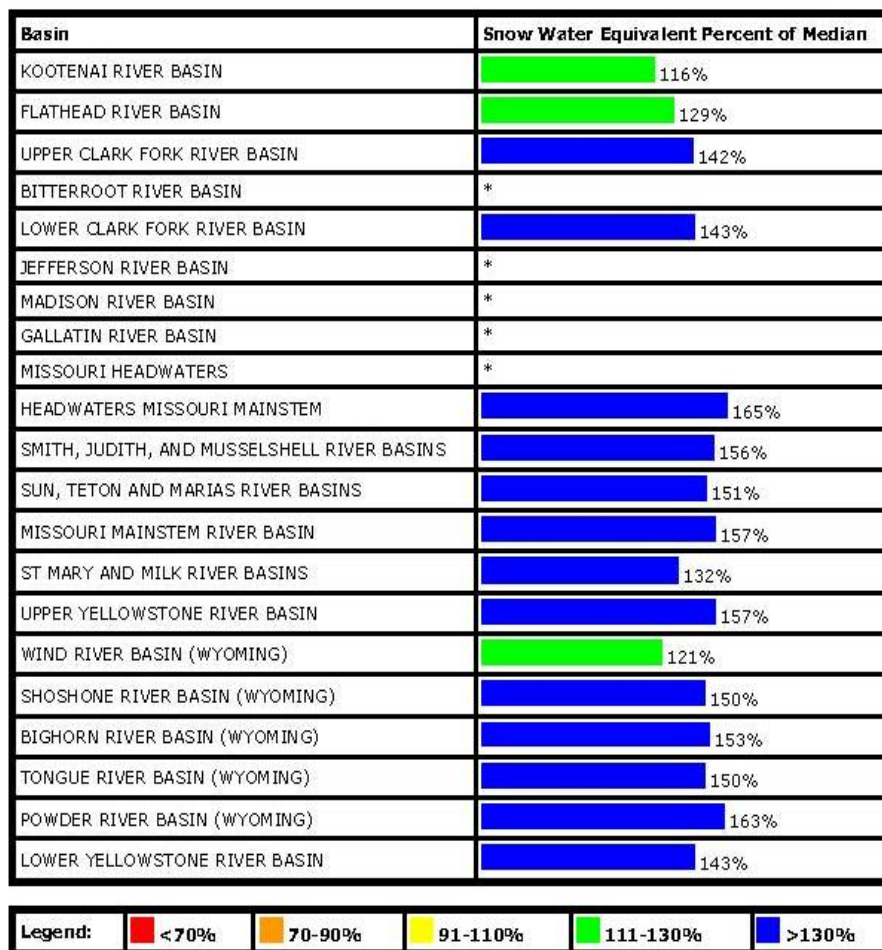


\* = Data are not available or data may not provide a valid measure of conditions for over half of the sites within the basin.



## MONTANA SNOTEL Snow Water Equivalent Update Graph

As of **WEDNESDAY: APRIL 16 , 2014**



\* = Data are not available or data may not provide a valid measure of conditions for over half of the sites within the basin.

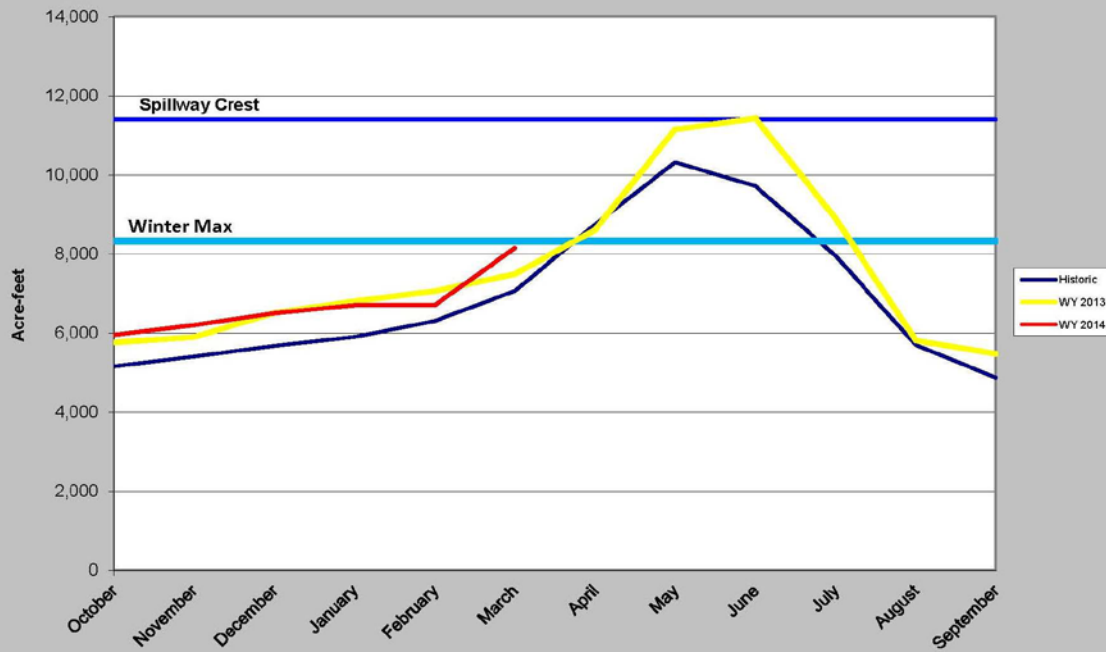


## Montana DNRC State Water Projects Bureau Reservoirs



# North Fork Smith River

(Historic, WY 2013, and WY 2014)



- 71% Capacity
- 115% average
- 8,148 Acre-Feet
- Water Supply is favorable



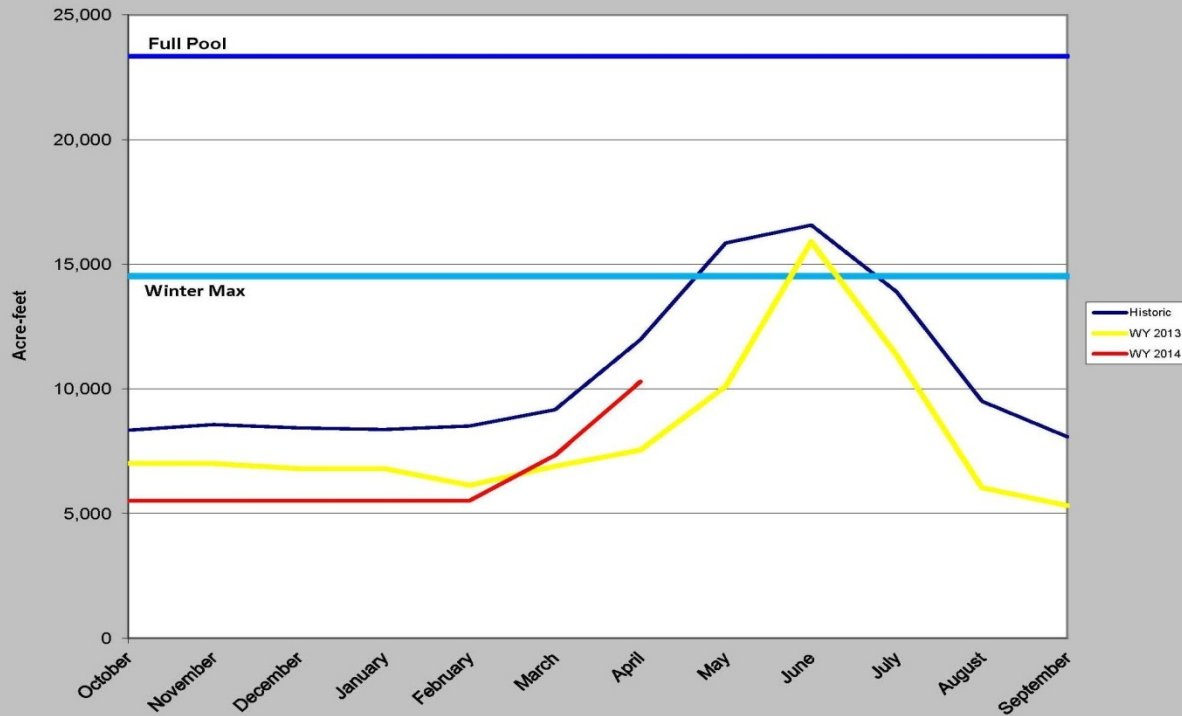
# Montana DNRC State Water Projects Bureau Reservoirs





# Martinsdale Reservoir

(Historic, WY 2013, and WY 2014)



- 44% Capacity
- 97% average
- 10,292 Acre-Feet
- Inflows ~ 125 cfs
- Outflows=0 cfs
- Water Supply is favorable



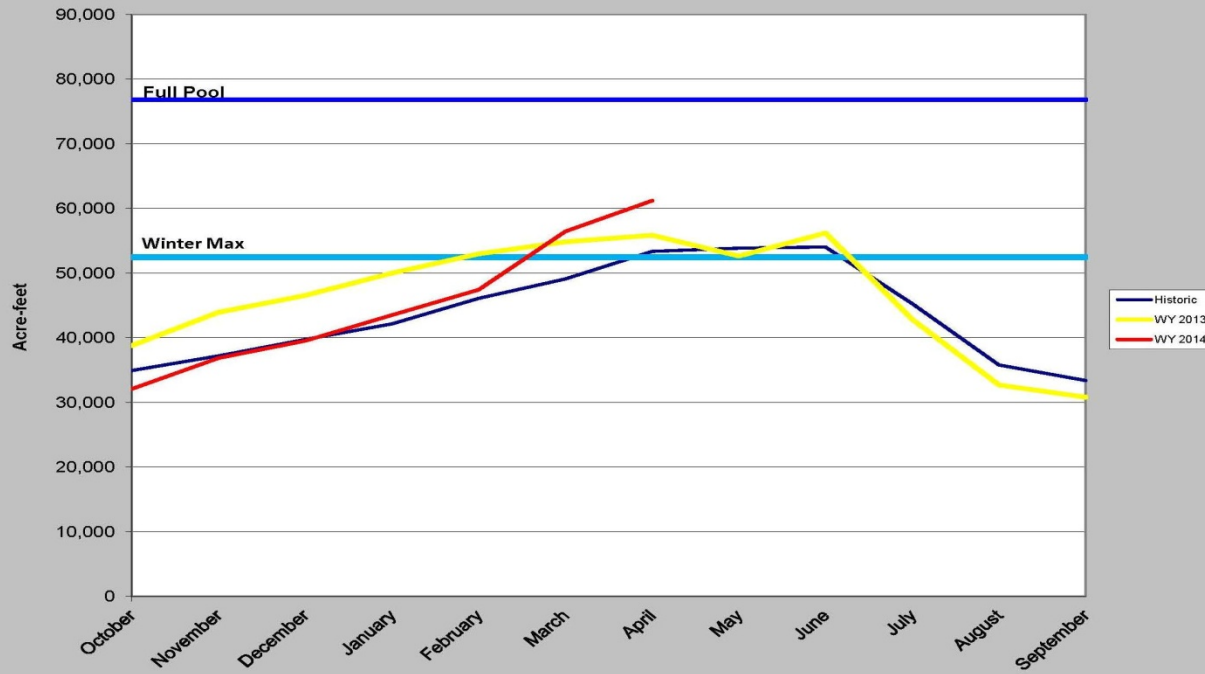


## Montana DNRC State Water Projects Bureau Reservoirs



# Deadman's Basin

(Historic, WY 2013, and WY 2014)



- 81% Capacity
- 119% average
- 61,200 Acre-Feet
- Elev.=3913.6
- Inflow~200 cfs
- Water Supply is favorable

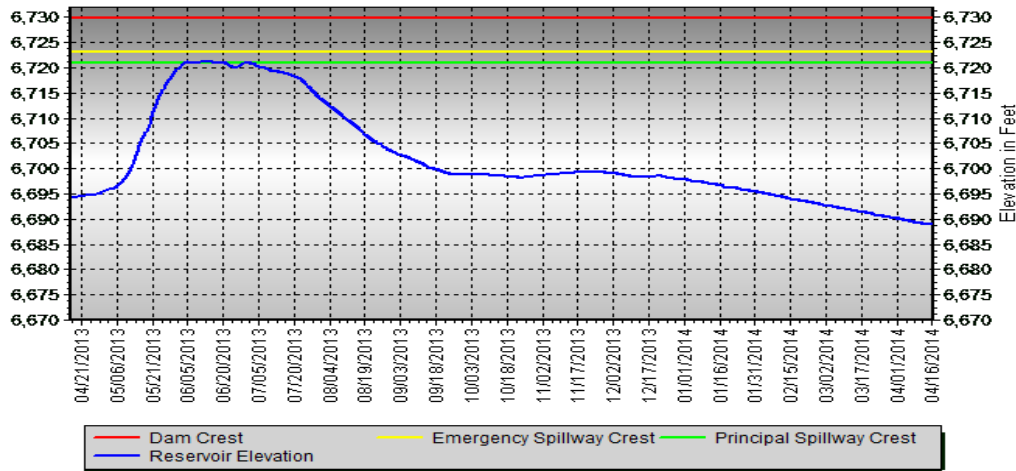


## Montana DNRC State Water Projects Bureau Reservoirs





# MIDDLE CREEK DAM RESERVOIR ELEVATION — 365 DAYS



TIME OF LAST READING 4/16/2014 9:00:00 AM

RESERVOIR ELEVATION 6,688.9 FT

RESERVOIR VOLUME 4,289 AF

MIDDLE CREEK BELOW DAM \*\*\*ICE\*\*\*

TIME OF LAST READING 4/16/2014 9:45:00 AM

REFERENCE INFORMATION

FT (MSL)

AC-FT

DAM CREST

6730.0

12,790

EMERGENCY SPILLWAY CREST

6723.0

10,707

PRINCIPAL SPILLWAY CREST

6721.0

10,184

LOWEST USABLE ELEVATION

6637.0

0

\*\*\* PROVISIONAL DATA SUBJECT TO REVISION \*\*\*

- 42% Capacity
- 67% Average
- Outflows~ 15 cfs
- 4,289 Acre-Feet
- Elev.=6688.9
- Water Supply is favorable

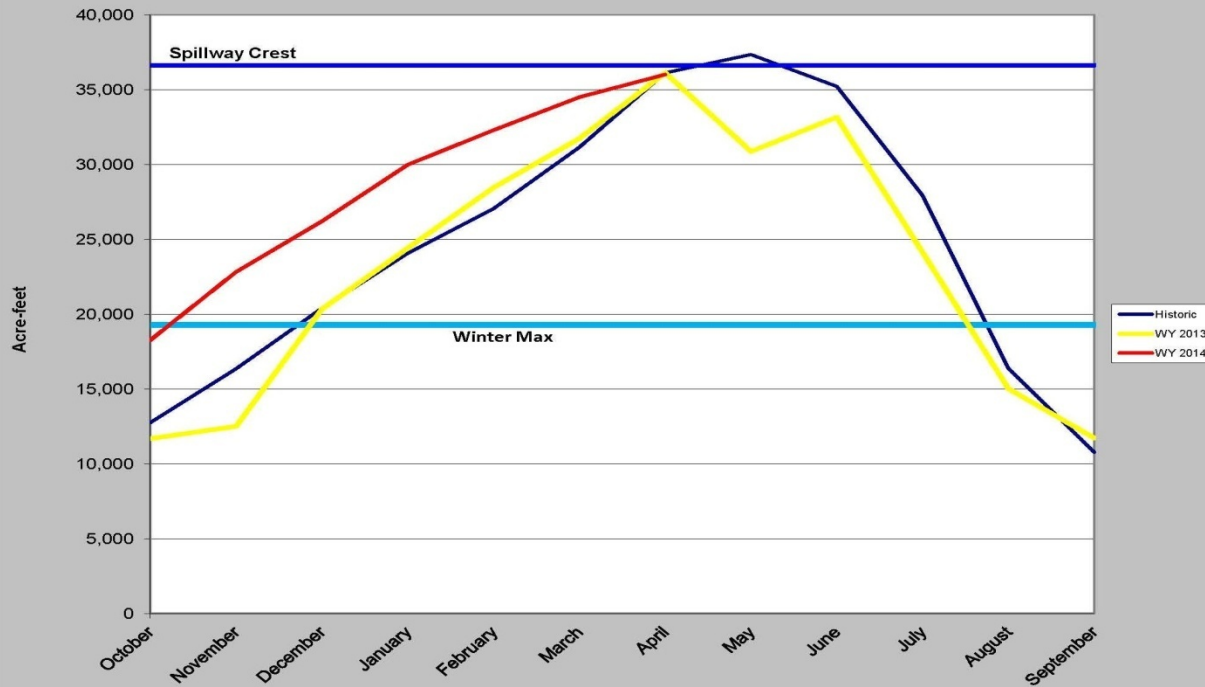


# Montana DNRC State Water Projects Bureau Reservoirs



# Ruby Reservoir

(Historic, WY 2013, and WY 2014)



- 98% Capacity
- 107% average
- 36,015 Acre-Feet
- Elev.=5391.36
- Inflows=121 cfs
- Outflows=46 cfs
- Water Supply is favorable





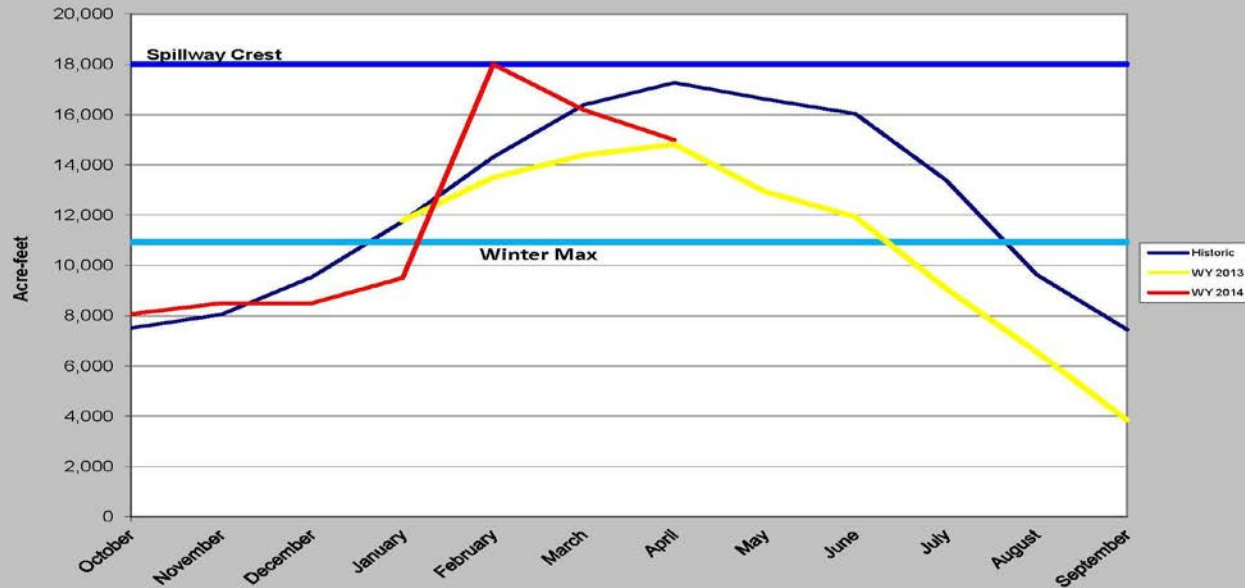
# Montana DNRC State Water Projects Bureau Reservoirs





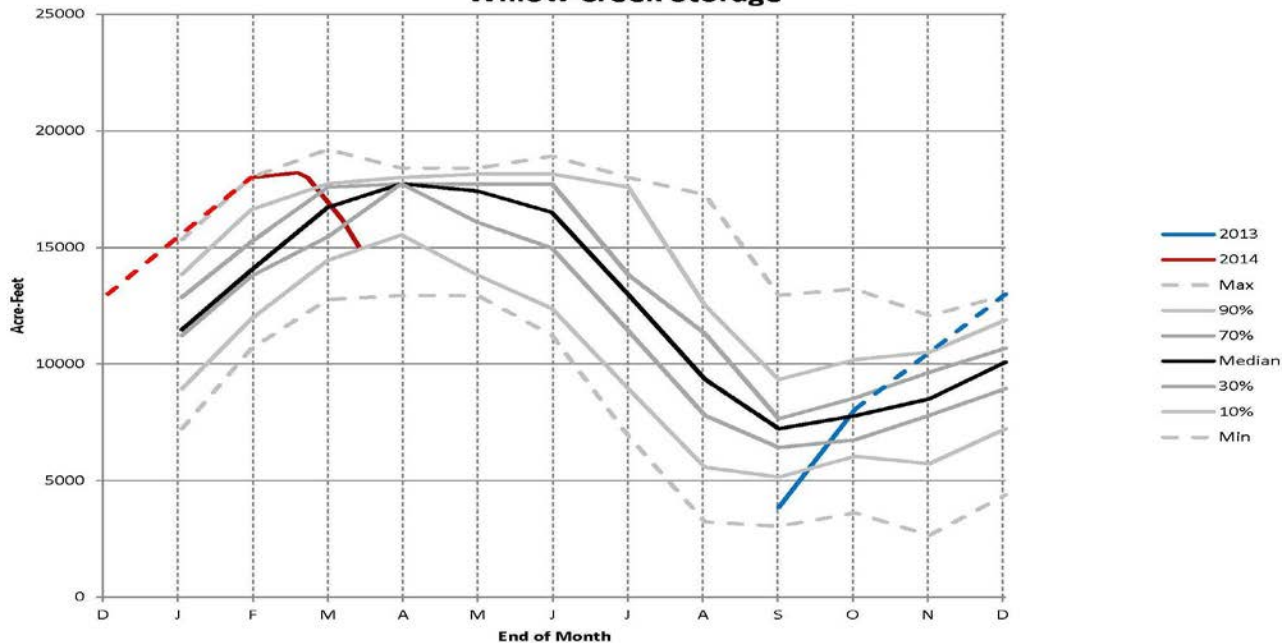
# Willow Creek Reservoir

(Historic, WY 2013, and WY 2014)



- 83% Capacity
- 89% average
- 14,988 Acre-Feet
- Elev.=4732.22
- Inflows= 52 cfs
- Outflows=90 cfs
- Water Supply is favorable

## Willow Creek Storage

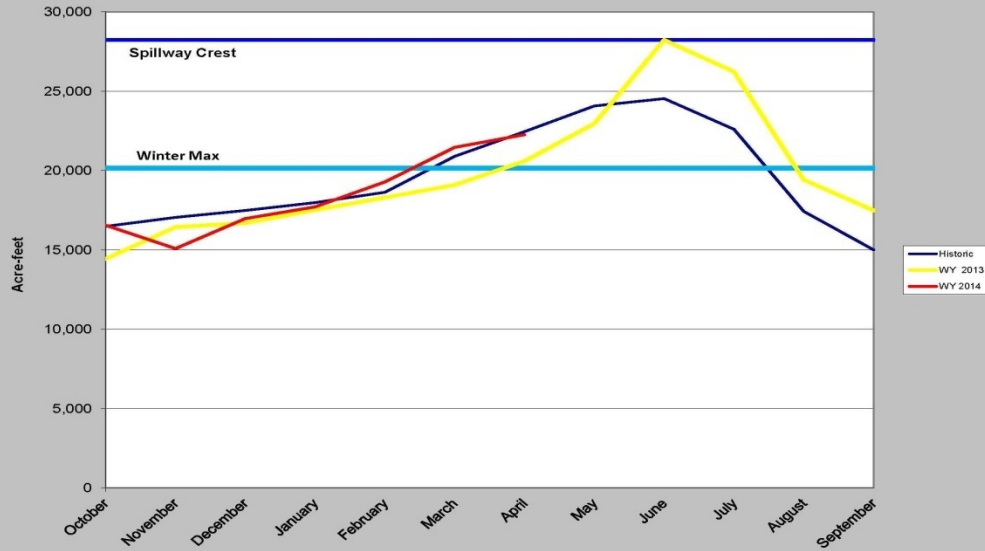


# Montana DNRC State Water Projects Bureau Reservoirs



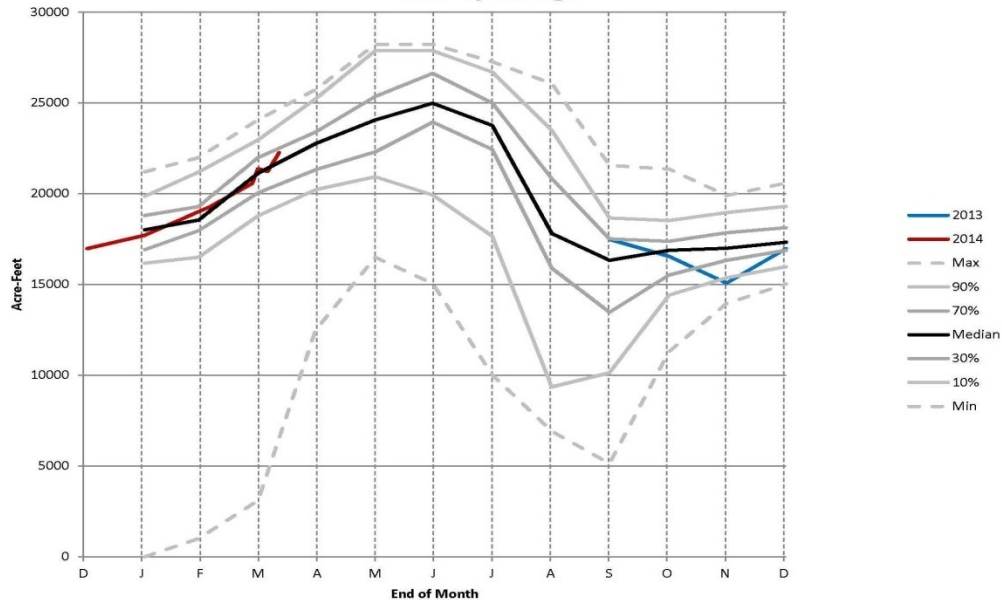
## Cooney Reservoir

(Historic, WY 2013, and WY 2014)



- 79% Capacity
- 99% average
- 22,265 Acre-Feet
- Elev.=4243.9
- Inflows= 270 cfs
- Outflows=435 cfs
- Water Supply is favorable

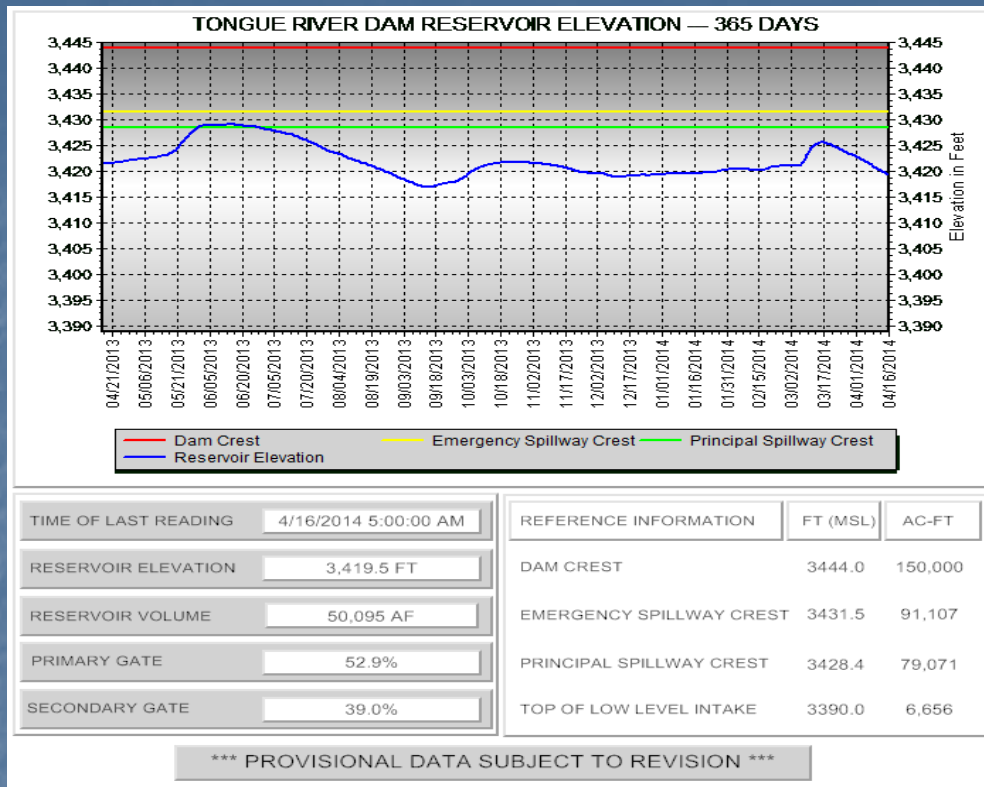
## Cooney Storage



## Montana DNRC State Water Projects Bureau Reservoirs







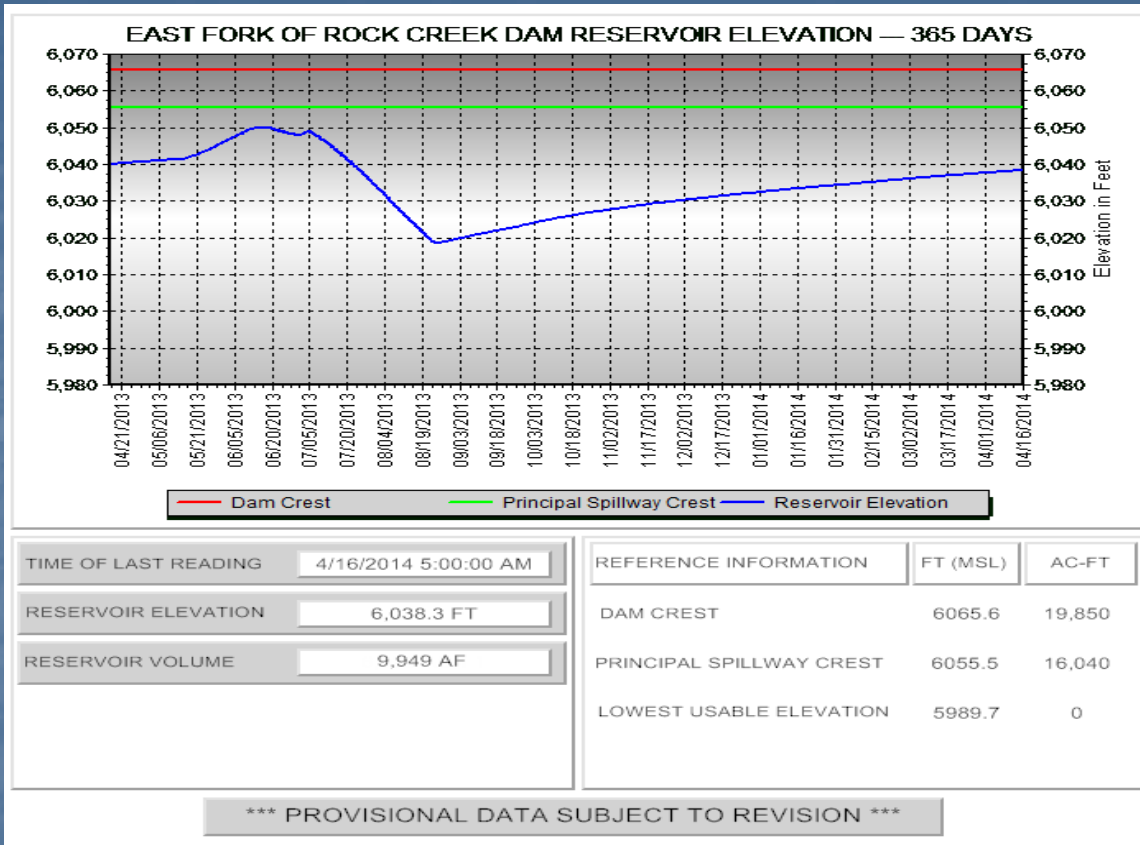
- 63% Capacity
- 99% Average
- 50,095 Acre-Feet
- Elev.=3419.5
- Inflows=531 cfs
- Outflows=800 cfs
- Water Supply is favorable



## Montana DNRC State Water Projects Bureau Reservoirs







- 62% Capacity
- 103% average
- 9,949 Acre-Feet
- Elev. = 6038.3
- Water Supply is favorable



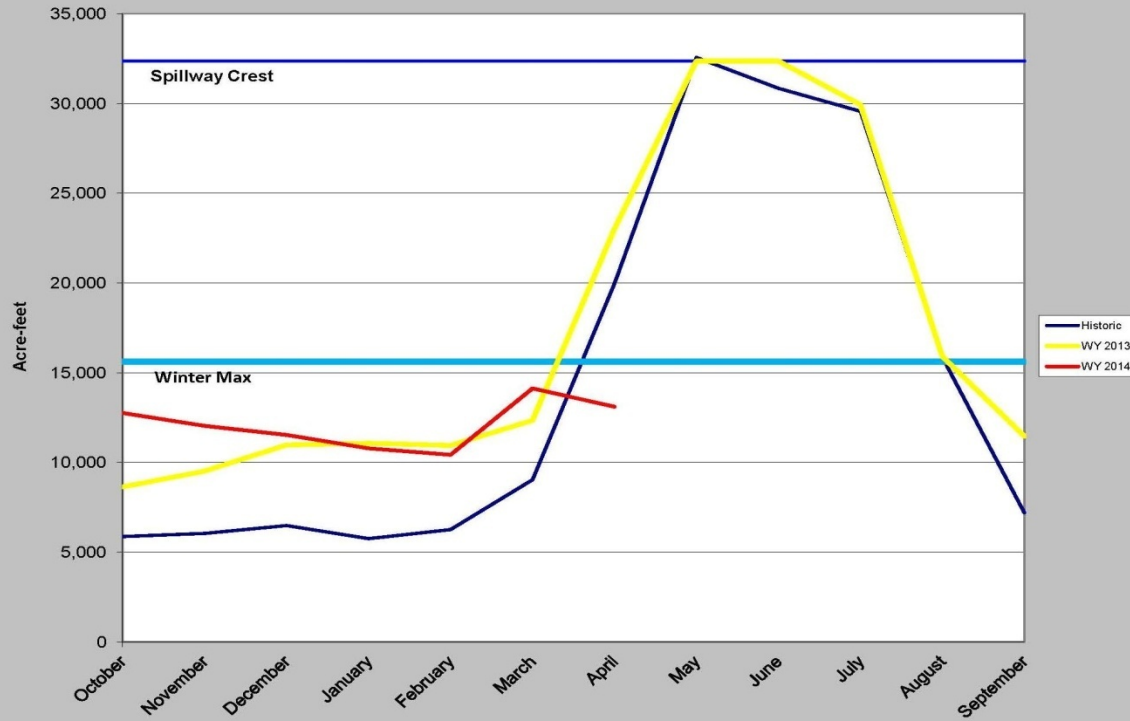
# Montana DNRC State Water Projects Bureau Reservoirs





# Painted Rocks Reservoir

(Historic, WY 2013, and WY 2014)



- 4/06/2013 data
- 45% Capacity
- 90% average
- 13,101 Acre-Feet
- Elev.=4686.4
- Inflows~390 cfs
- Outflows=437 cfs
- Water Supply is favorable



# Summary

- Winter Carryover varied across the state from below average to average to above average to start WY 2014
- Snowpack for SWP reservoirs above average to well above average
- Off-stream Reservoirs capturing early season runoff
- Water Users Associations in conjunction with DNRC SWP have increased discharges at select reservoirs to draft storage levels.
- DNRC SWP reservoirs are not operated as Flood Control Facilities but drafting select reservoirs can potentially mitigate downstream effects.



00/8/10

# Governor's Drought & Water Supply Advisory Committee April NRCC Update



Harold Gemmell, Direct Fire Protection Coordinator  
DNRC

[hgemmell@mt.gov](mailto:hgemmell@mt.gov) 406 329-4996





# NRCC

Northern Rockies Coordination Center

*Mobilizing Incident Resources  
...throughout Montana, North Dakota,  
Northern Idaho, a small portion of  
Northwestern South Dakota and  
Yellowstone National Park*

[National GACC Portal](#) | [NRCC Home](#) | [About Us](#) | [Site Disclaimer](#) | [Contact Us](#)

Wednesday, May 22, 2013

## INCIDENT INFORMATION

## PREDICTIVE SERVICES

[Intelligence](#)  
[Weather](#)  
[Fuels/Fire Danger](#)  
[Outlooks](#)

## LOGISTICS / DISPATCH

[Dispatch Operations](#)  
[Aviation](#)  
[Crews](#)  
[Equipment/Supplies](#)  
[Overhead](#)

## ADMINISTRATIVE

[Northern Rockies  
Coordinating Group](#)  
[Policy and Reports](#)  
[Incident Business  
Management](#)  
[Safety Management](#)  
[Software Applications](#)  
[Training](#)

## RELATED LINKS

[National](#)  
[Area](#)

## Welcome to the NORTHERN ROCKIES COORDINATION CENTER

The **Northern Rockies Coordination Center (NRCC)** is the interagency focal point for coordinating the mobilization of resources for wildland fire and other all-hazard incidents throughout the Northern Rockies Area and, when necessary, for assignment throughout the United States. Located in Missoula, Montana, the Center also provides Intelligence and Predictive Services related products for use by the wildland fire community for purposes of wildland fire and incident management decision-making.

There are five primary components to the NRCC website.

- [Incident Information](#) provides general information on large wildland fires, fire restrictions and closures, and other relevant activity throughout the Geographic Area.
- [Predictive Services](#) provides operational products and links to incident situation information, maps, resources, current fire weather conditions, forecasts, fuels, fire behavior as well as daily, weekly and monthly fire weather/fire danger outlooks.
- [Logistics/Dispatch](#) provides detailed operation and information links for aviation, crews, equipment and overhead, including Incident Management Teams.
- [Administrative](#) provides fire and incident management tools and links including policies and reports, business management, safety, software applications, and training.
- [Related Links](#) component provides links to related Internet websites within the Northern Rockies Area and nationally.



## BULLETIN BOARD

### SITUATION

#### PREPAREDNESS LEVELS

Northern Rockies PL: **1**  
National PL: **1**

[Situation Reports](#)

[Year-to-Date & Historical Wildfire Data](#)

... [Restrictions & Closures](#) ...

### SAFETY ALERTS

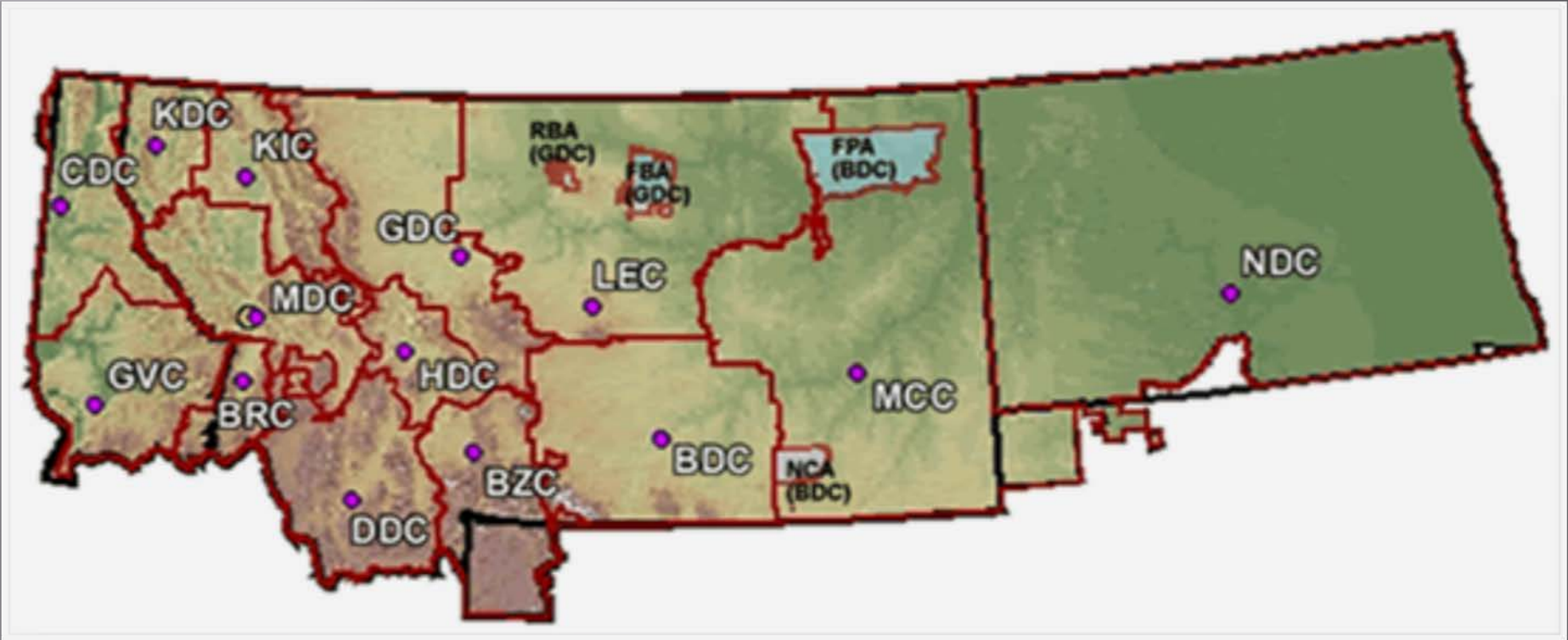
[NRGA Landscape Mortality Safety Alert](#)  
[NRGA Landscape Mortality Pocket Card](#)

[Coal Seam Fires Safety](#)

COOPERATING FEDERAL, STATE AND OTHER AGENCIES IN THE NORTHERN ROCKIES AREA



## The Northern Rockies Geographic Area



Northern Idaho, Montana, Yellowstone National Park, North Dakota and a small portion of South Dakota.



# Factors that Influence Fire Season Severity

*Early indicators suggest near – below normal temperatures and slightly above average precipitation*



Spring Factor

*Snowpack is generally 115 – 170% of normal, but melting rates are much more important than actual snowpack accrual*



Winter Snowpack Melt

*Fall was “near average” across the NR region. Slightly above normal precipitation on East of the Divide, slightly below West of the Divide*



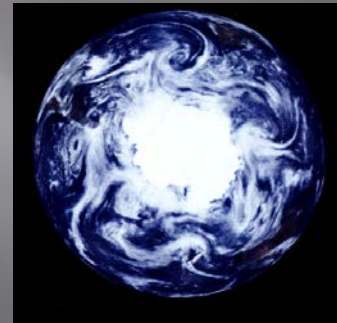
July Temperatures and Precipitation



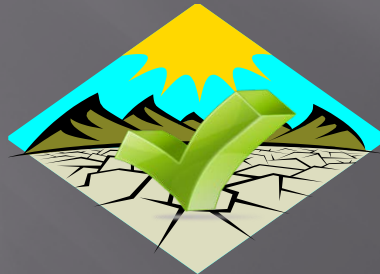
Summer Convection



Live/Dead Fuel Moisture



Ocean/ Atmospheric Circulations  
ENSO/PDO, etc.



Fall Moisture and Pre-existing Drought Conditions

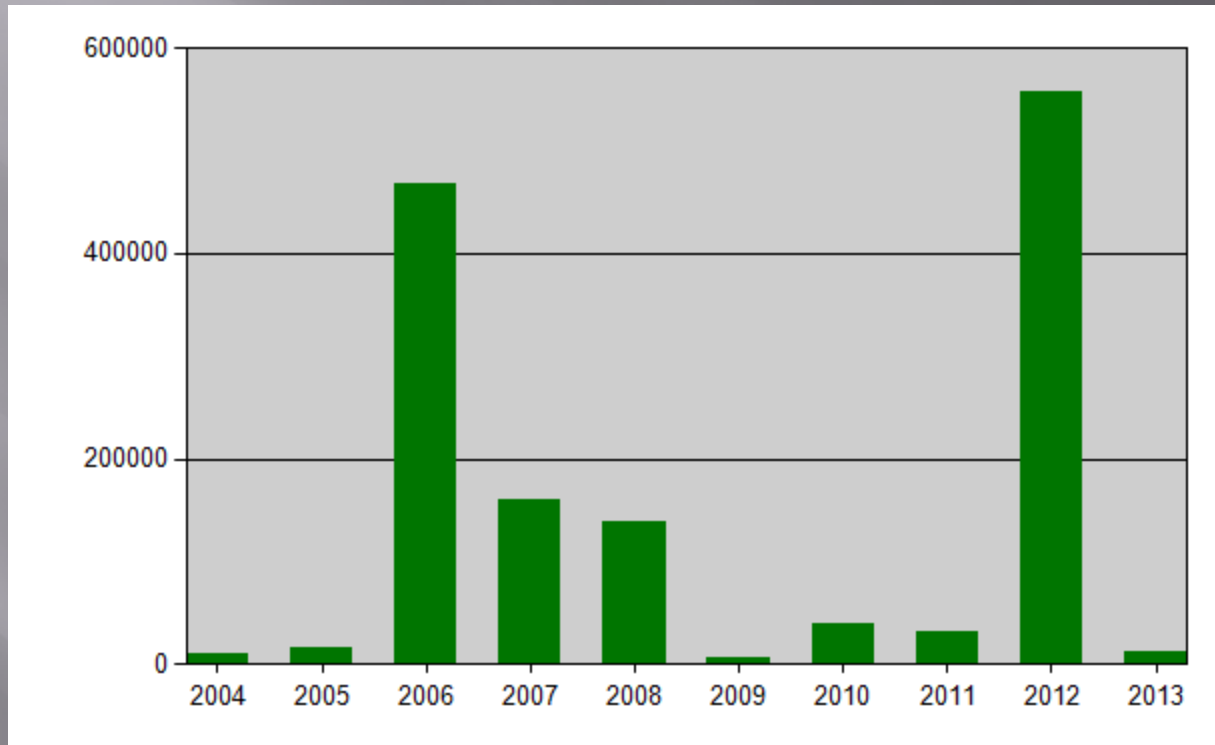


## 10-year Average Montana Fire Season Statistics By Protection Agency

Agency	Avg Fires	Avg Acres
Bureau of Indian Affairs	895	66,423
Bureau of Land Management	100	56,391
US Fish and Wildlife Service <sup>28</sup>	28	13,363
National Park Service	26	8764
Private Land	379	88,297
MT DNRC	258	44,858
US Forest Service	897	201,643
(2004-2013) 10-year Average	2818	487001

# Number of Acres 2004 - 2013

Direct Protection, County Assist



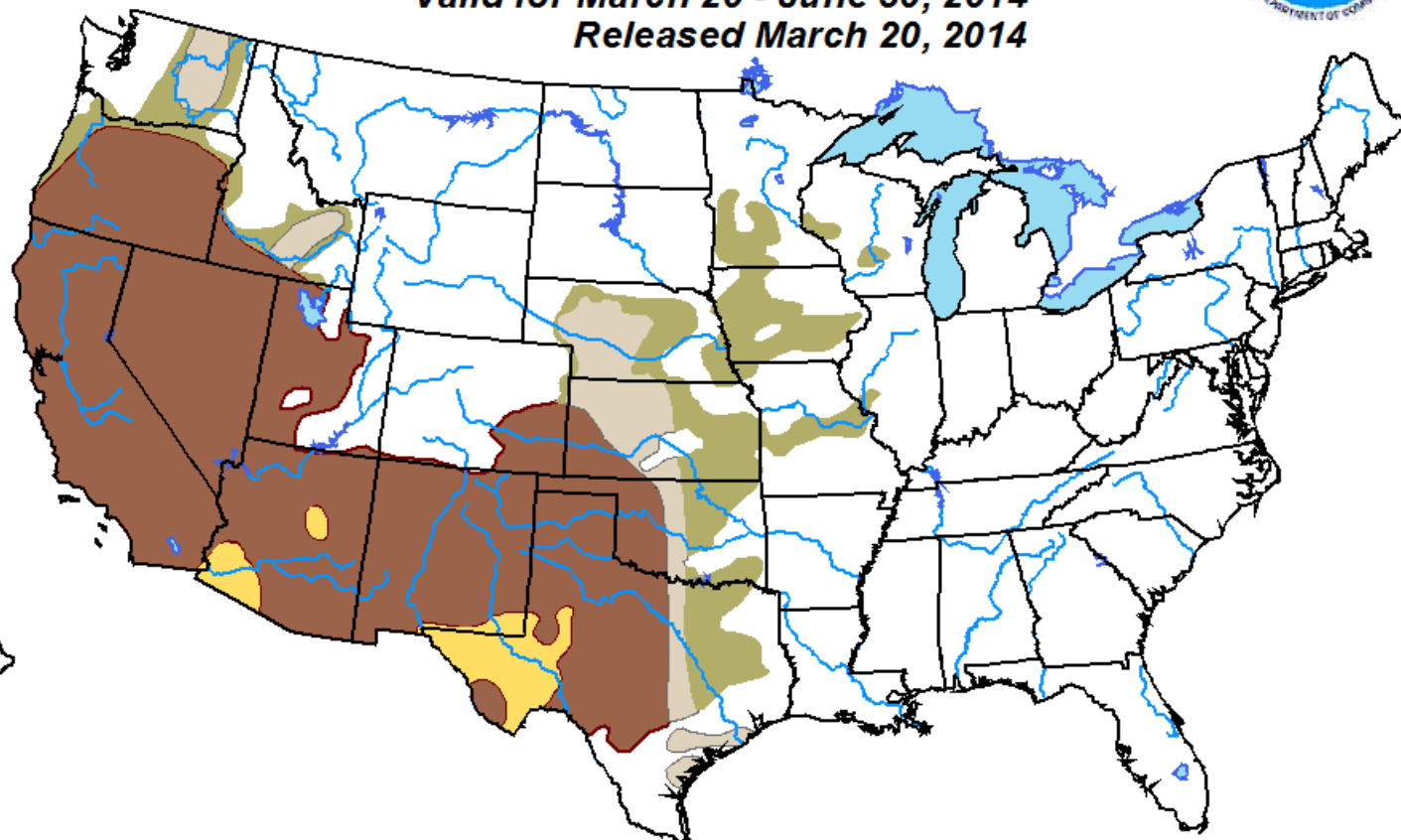


# U.S. Seasonal Drought Outlook

## Drought Tendency During the Valid Period

Valid for March 20 - June 30, 2014

Released March 20, 2014



### KEY:

**Drought persists or intensifies**

**Drought remains but improves**

**Drought removal likely**

**Drought development likely**

**Author: Anthony Artusa, Climate Prediction Center, NOAA**  
[http://www.cpc.ncep.noaa.gov/products/expert\\_assessment/season\\_drought.html](http://www.cpc.ncep.noaa.gov/products/expert_assessment/season_drought.html)

Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance. Use caution for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.

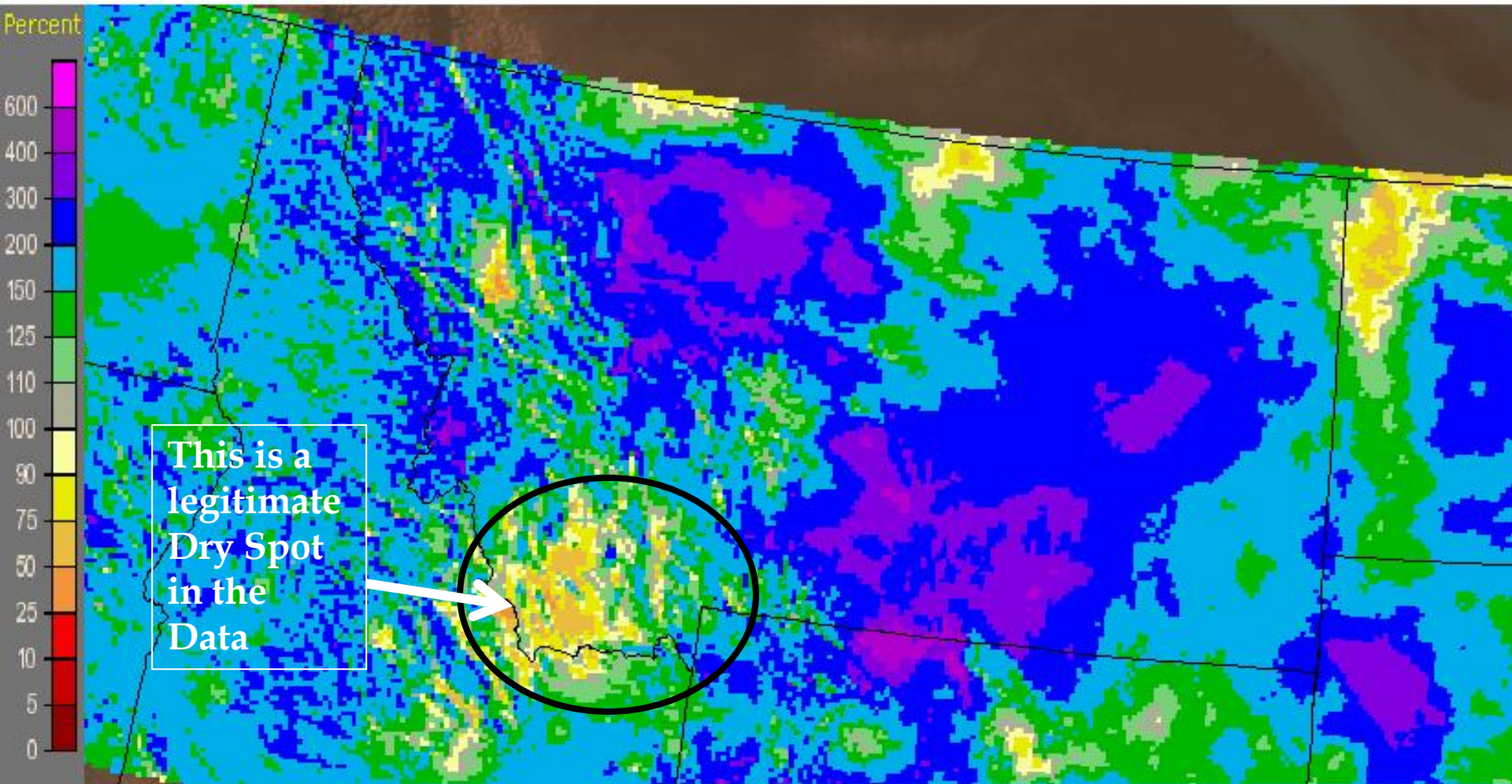
NOTE: The tan area areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain.

The Green areas imply drought removal by the end of the period (D0 or none)



## Percent of Normal Precipitation (Last 60 days)

Montana: Current 60-Day Percent of Normal Precipitation  
Valid at 4/7/2014 1200 UTC- Created 4/7/14 23:53 UTC



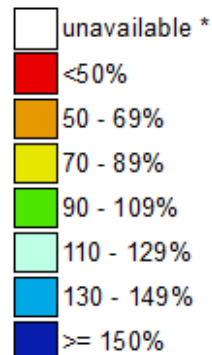


# Snowpack (SWE)

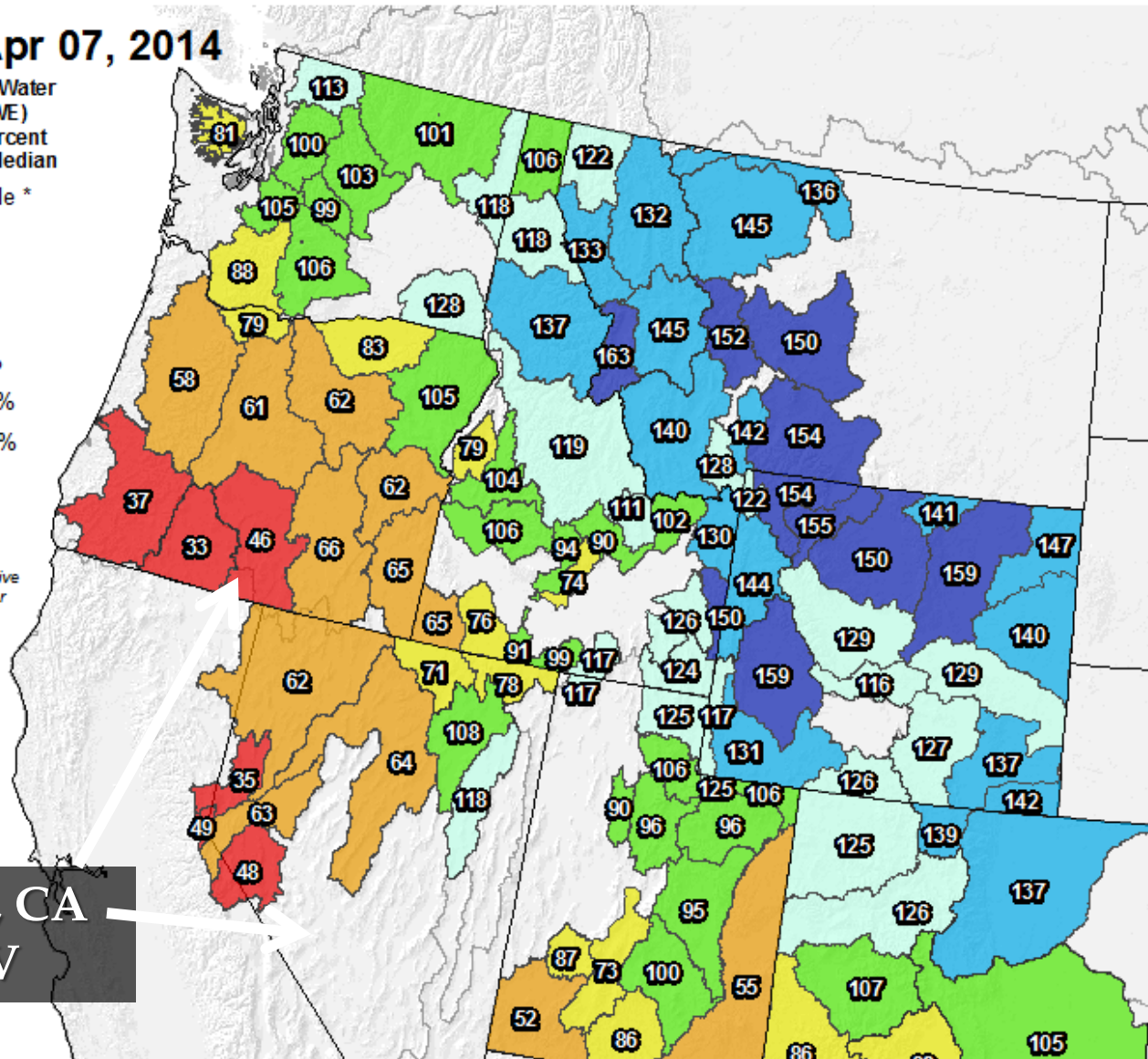
## Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 07, 2014

Current Snow Water  
Equivalent (SWE)  
Basin-wide Percent  
of 1981-2010 Median

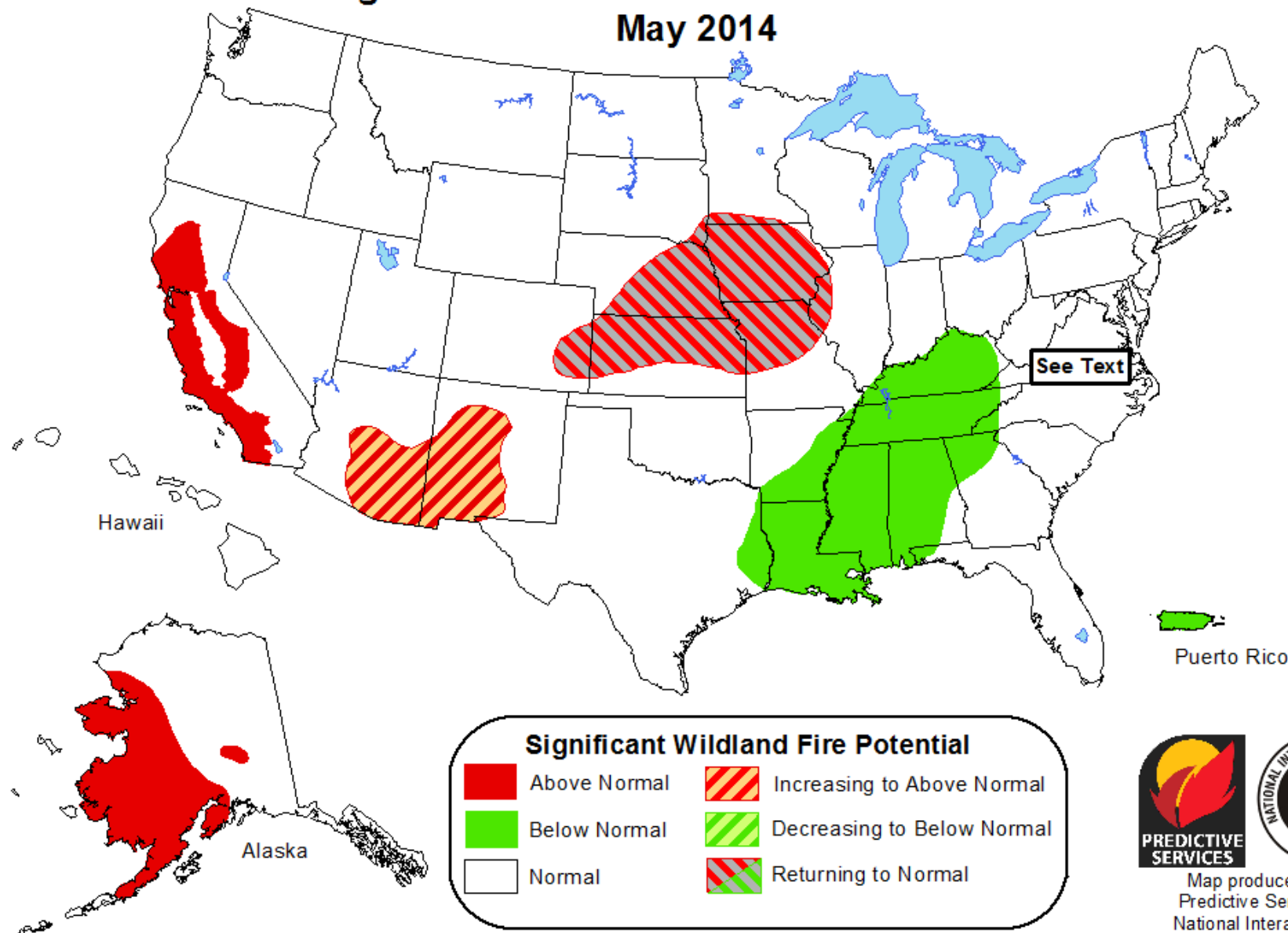


\* Data unavailable  
at time of posting  
or measurement  
is not representative  
at this time of year



Notice: OR, CA  
and NW NV

# Significant Wildland Fire Potential Outlook May 2014



## Significant Wildland Fire Potential

	Above Normal		Increasing to Above Normal
	Below Normal		Decreasing to Below Normal
	Normal		Returning to Normal

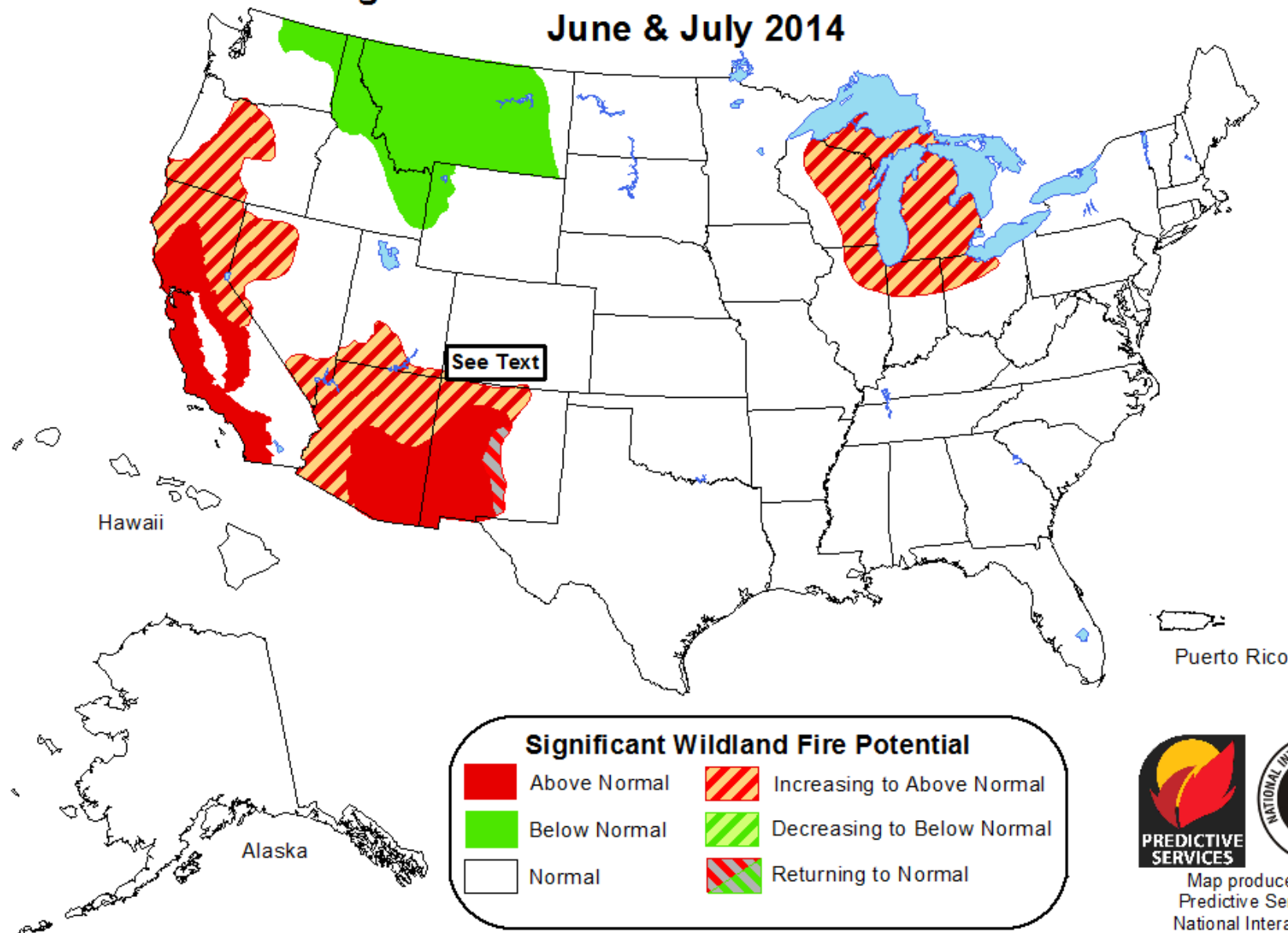


Map produced by  
Predictive Services,  
National Interagency  
Coordination Center  
Boise, Idaho

Issued April 1, 2014  
Next issuance May 1, 2014

Above normal significant wildland fire potential indicates a higher than usual likelihood that wildland fires will occur and/or become significant events. Wildland fires are still expected to occur during forecasted normal conditions as would usually be expected during the outlook period. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.

# Significant Wildland Fire Potential Outlook June & July 2014



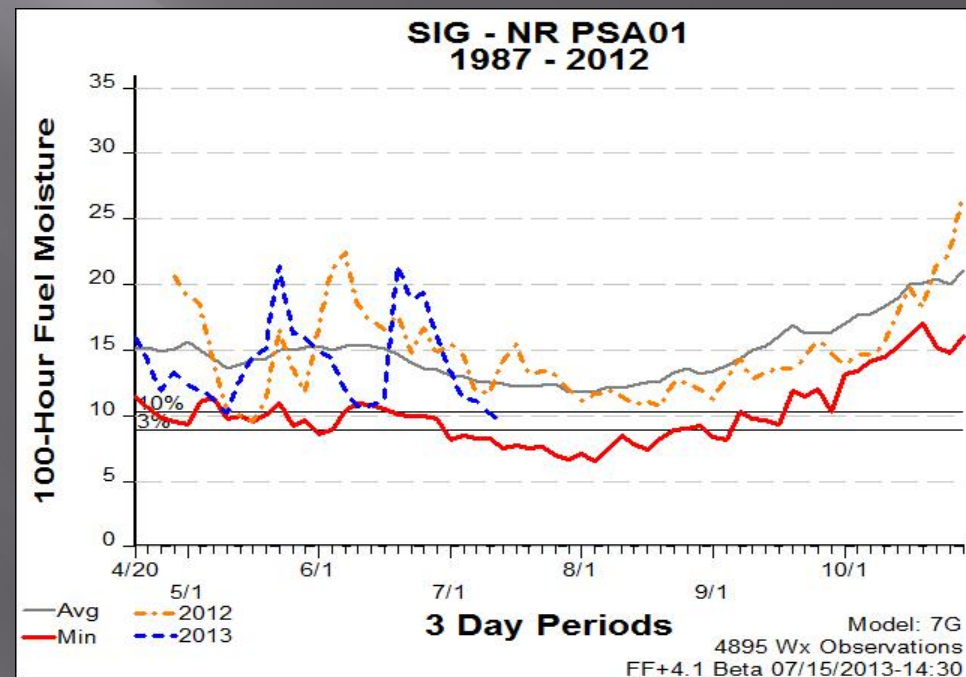
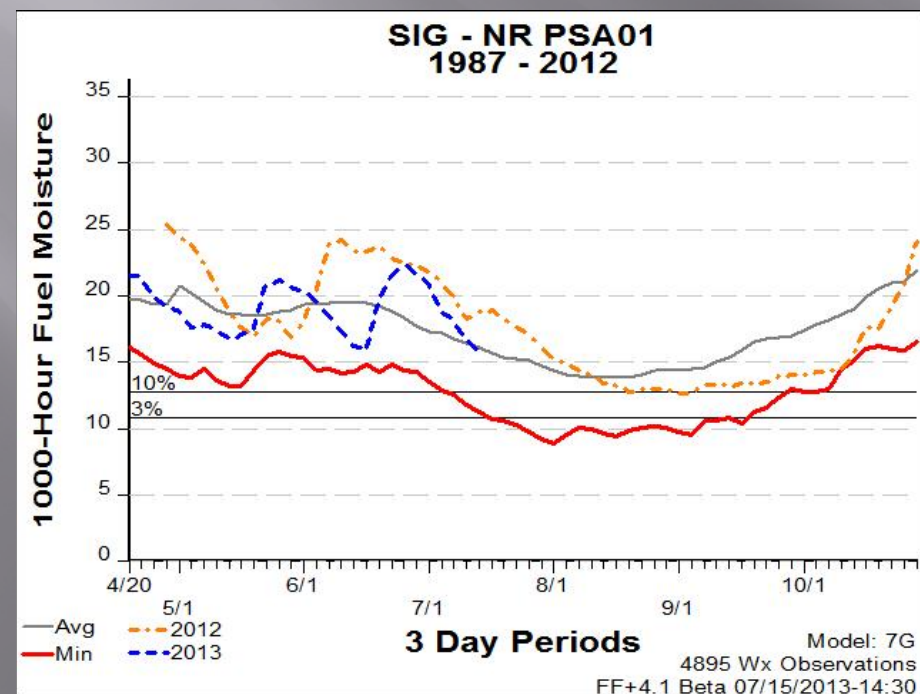
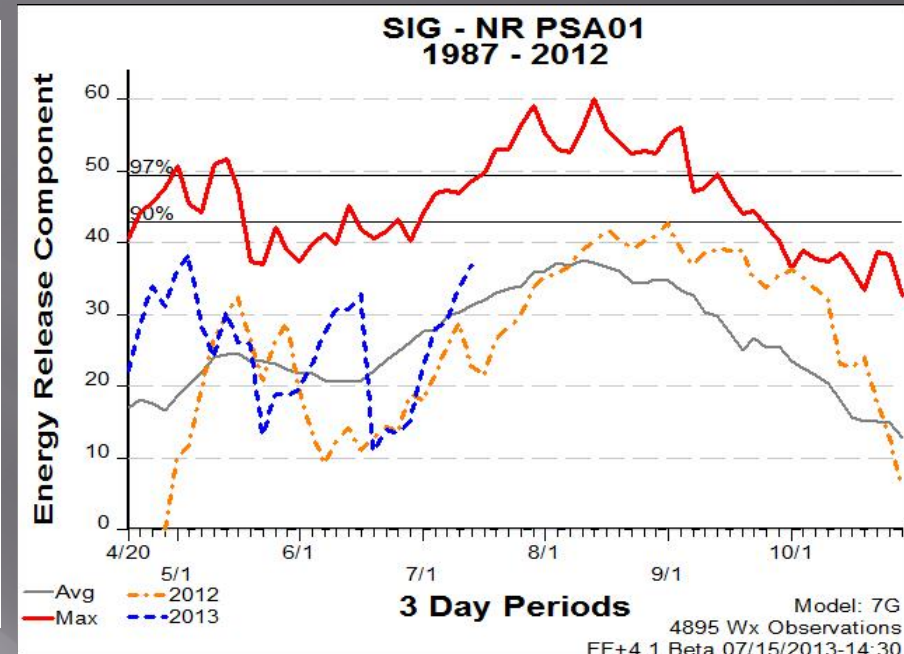
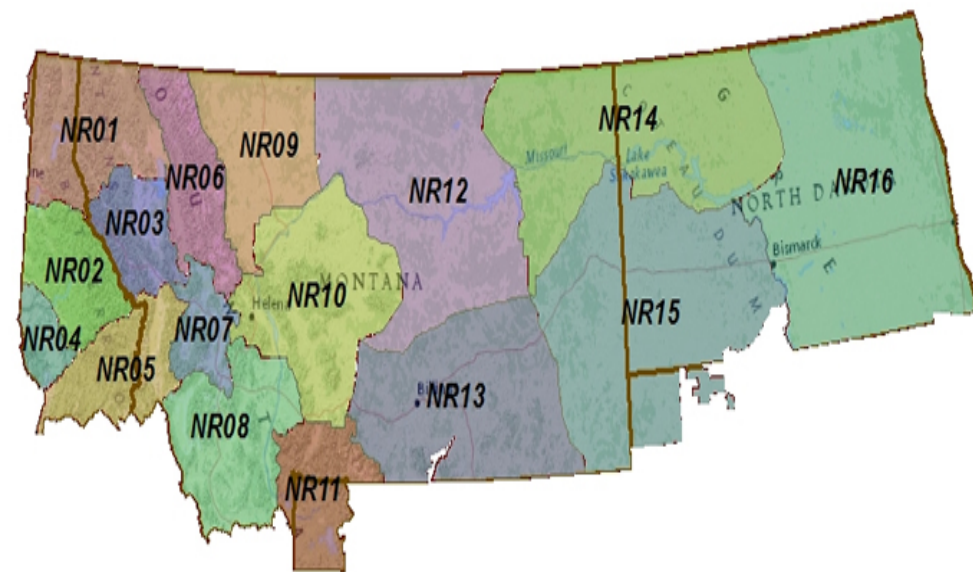
Above normal significant wildland fire potential indicates a higher than usual likelihood that wildland fires will occur and/or become significant events. Wildland fires are still expected to occur during forecasted normal conditions as would usually be expected during the outlook period. Significant wildland fires are still possible but less likely than usual during forecasted below normal periods.



Map produced by  
Predictive Services,  
National Interagency  
Coordination Center  
Boise, Idaho

Issued April 1, 2014  
Next issuance May 1, 2014





# NATIONAL FIRE DANGER RATING SYSTEM

Provides a measure of the relative seriousness of burning conditions and threat of fire.

## ▣ RAWS INPUTS

- Temperature
- Relative Humidity
- Fuel Moisture – live and dead
- Wind Speed



# NATIONAL FIRE DANGER RATING SYSTEM

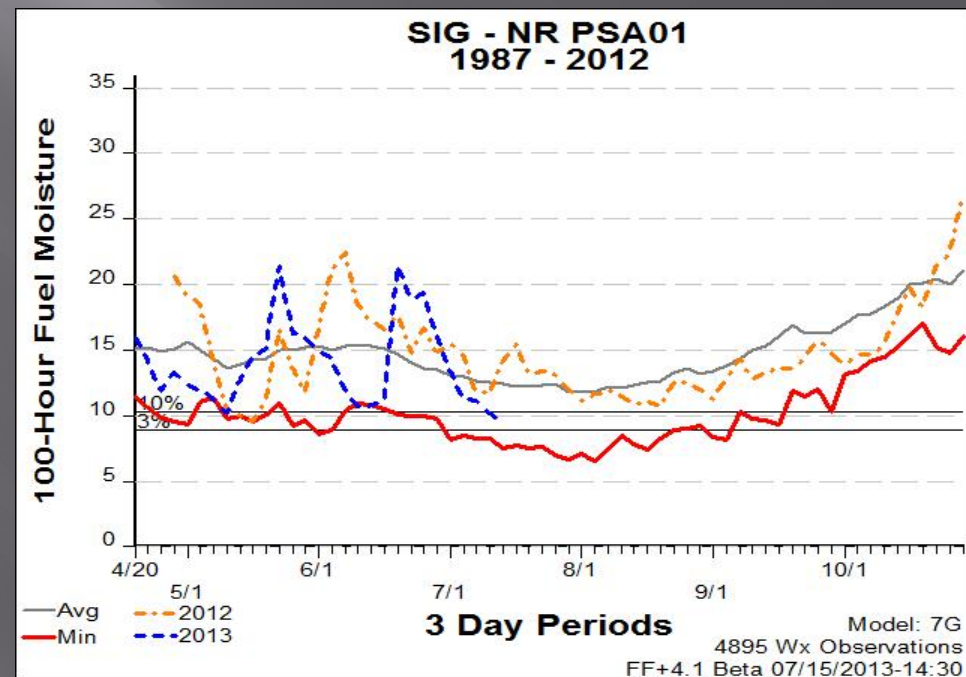
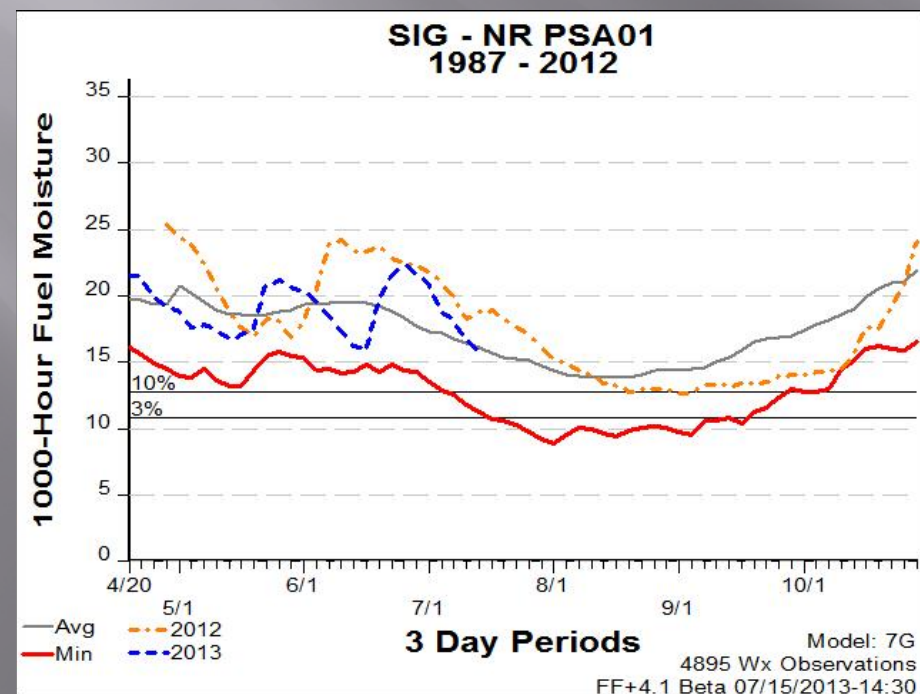
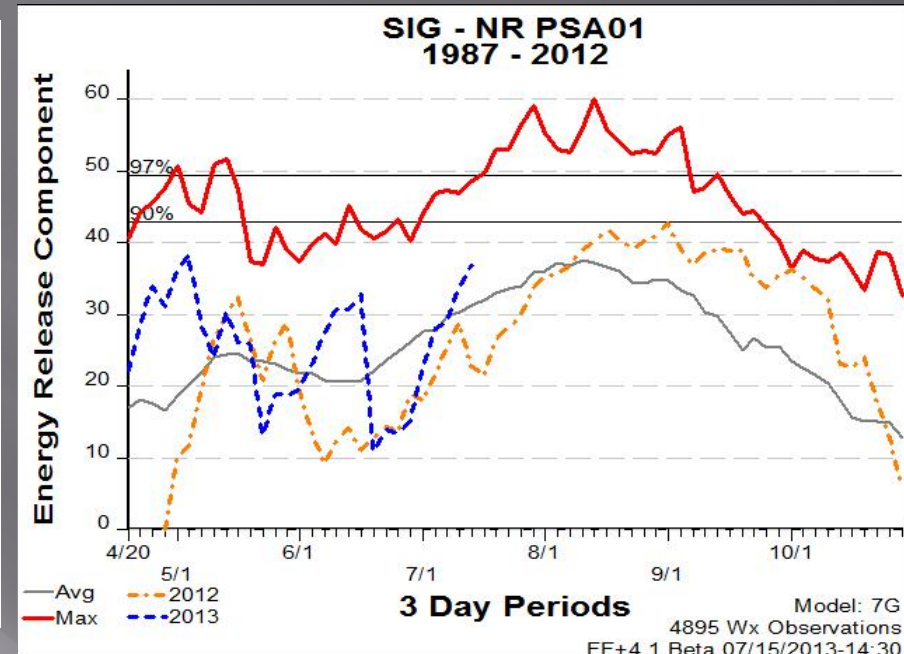
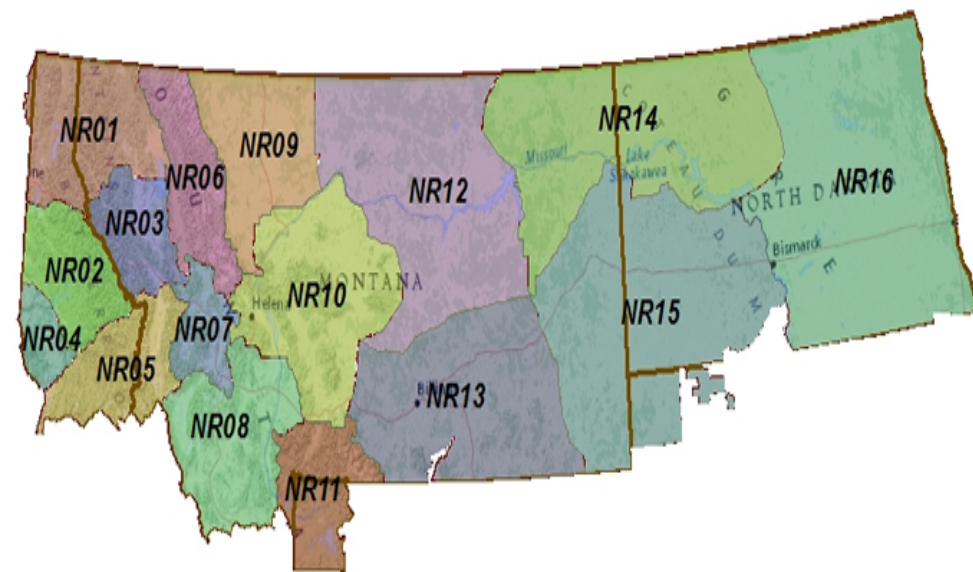
## ▣ WIMS OUTPUTS

- SPREAD COMPONENT – forward rate of spread of a wildfire
- BURNING INDEX – a measure of fire intensity at the head of a fire, a reference to flame length
- IGNITION COMPONENT – the probability that a firebrand will ignite a fire requiring suppression action
- ENERGY RELEASE COMPONENT – the amount of potential available energy at the head of a fire

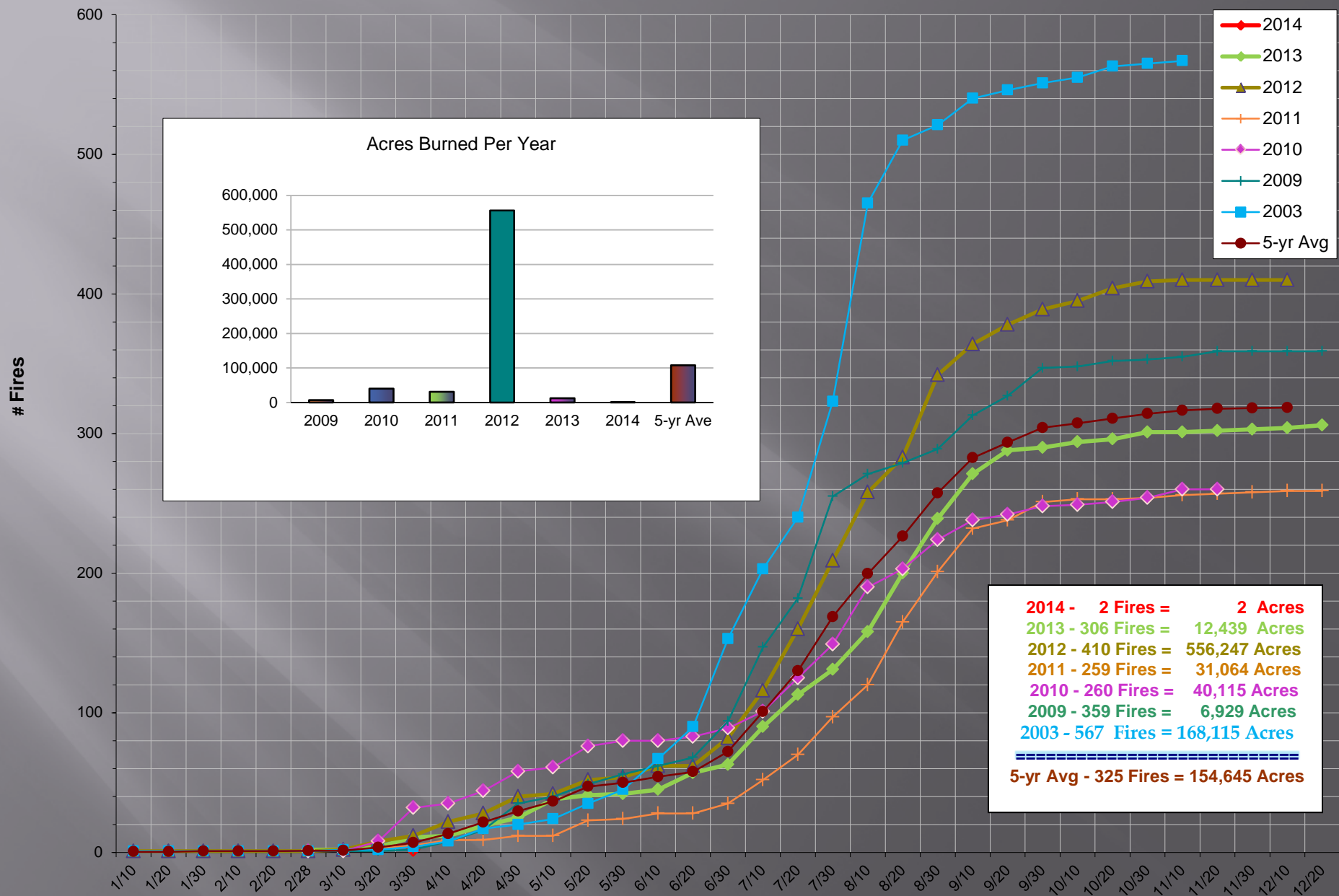
# NATIONAL FIRE DANGER RATING SYSTEM

## ▣ WIMS OUTPUTS

- ONE HOUR FUEL MOISTURE -  $< \frac{1}{4}$ " DIAMETER
- TEN HOUR FUEL MOISTURE -  $\frac{1}{4}$ " - 1"  
DIAMETER
- 100 HOUR FUEL MOISTURE - 1" - 3" DIAMETER
- 1000 HOUR FUEL MOISTURE -  $> 3$ " DIAMETER



# Fire Burned Summary - 2014





# Thoughts on Fire Season 2014

- ▣ The slight drought signals have been removed from our region.
- ▣ Snowpack is **WELL** above average.
- ▣ Spring should feature near normal temperatures with continued normal-above normal precipitation.
- ▣ Moderate confidence that weak El Nino will develop by summer; most similar years were 2002, **1997**, and 1986. **None of these were severe fire seasons. NR also in middle of historical 2-4 year break between high fire acreage years.**
- ▣ Areas of most concern remain OR, CA ,NV, and possibly AK.
- ▣ **The factors that we have looked at thus far make us most inclined to predict a “Below Normal to Normal” fire season this year.**

# Montana Drought and Water Supply Status by County

Change from March to April 2014 – Assessed 4/15/14  
(All changes one category)

## Increased

Lincoln

Sanders

Mineral

Teton

Hill

## Decreased

Toole

Daniels

Roosevelt

Garfield

Richland

McCone



***NOAA - National Weather Service***



# Montana Drought & Water Supply Advisory Committee

April 17, 2014

National Weather Service  
*Gina Loss – Service Hydrologist*

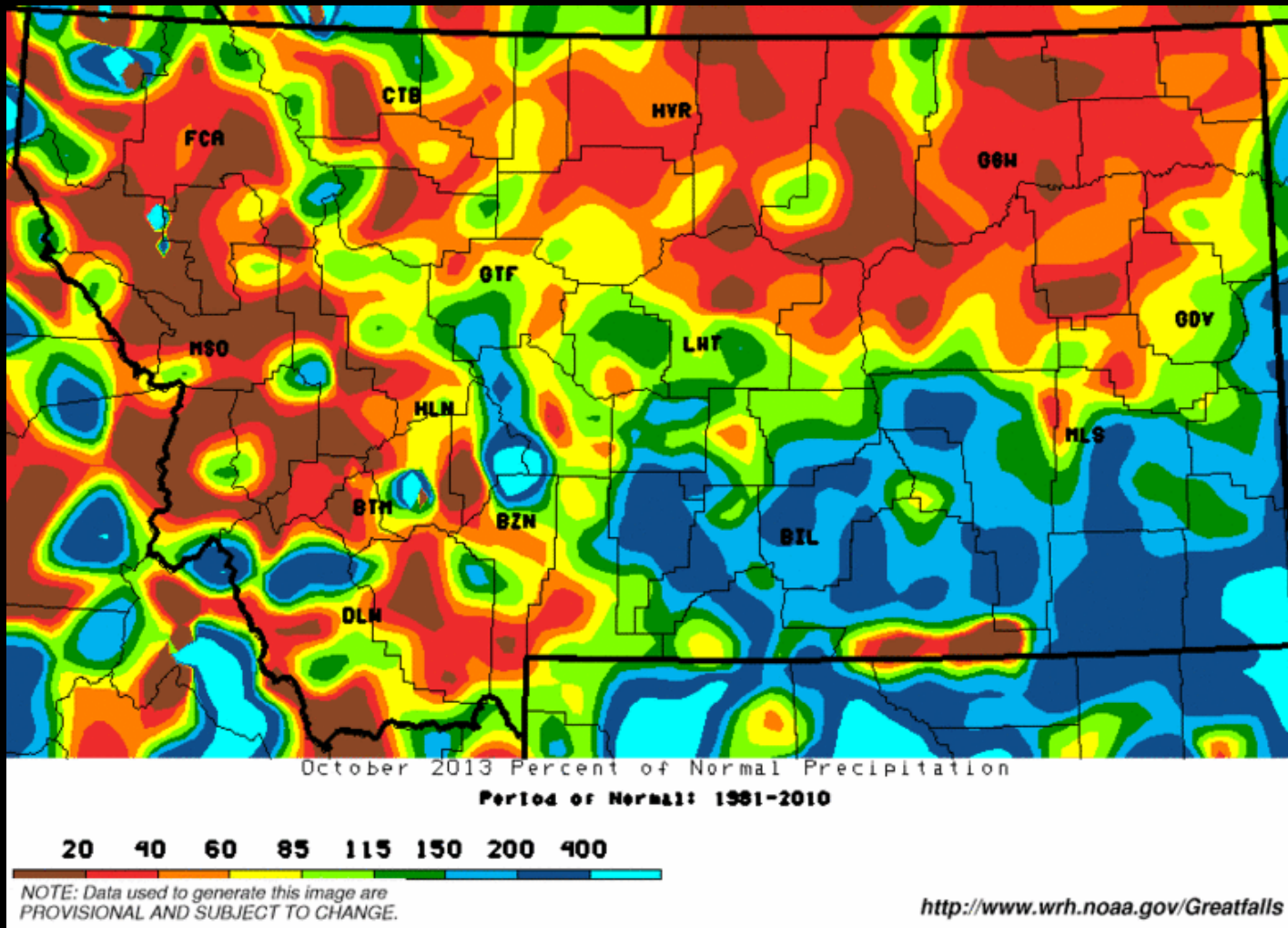


***NOAA - National Weather Service***



# Percent of Normal Precipitation October 2013

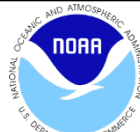
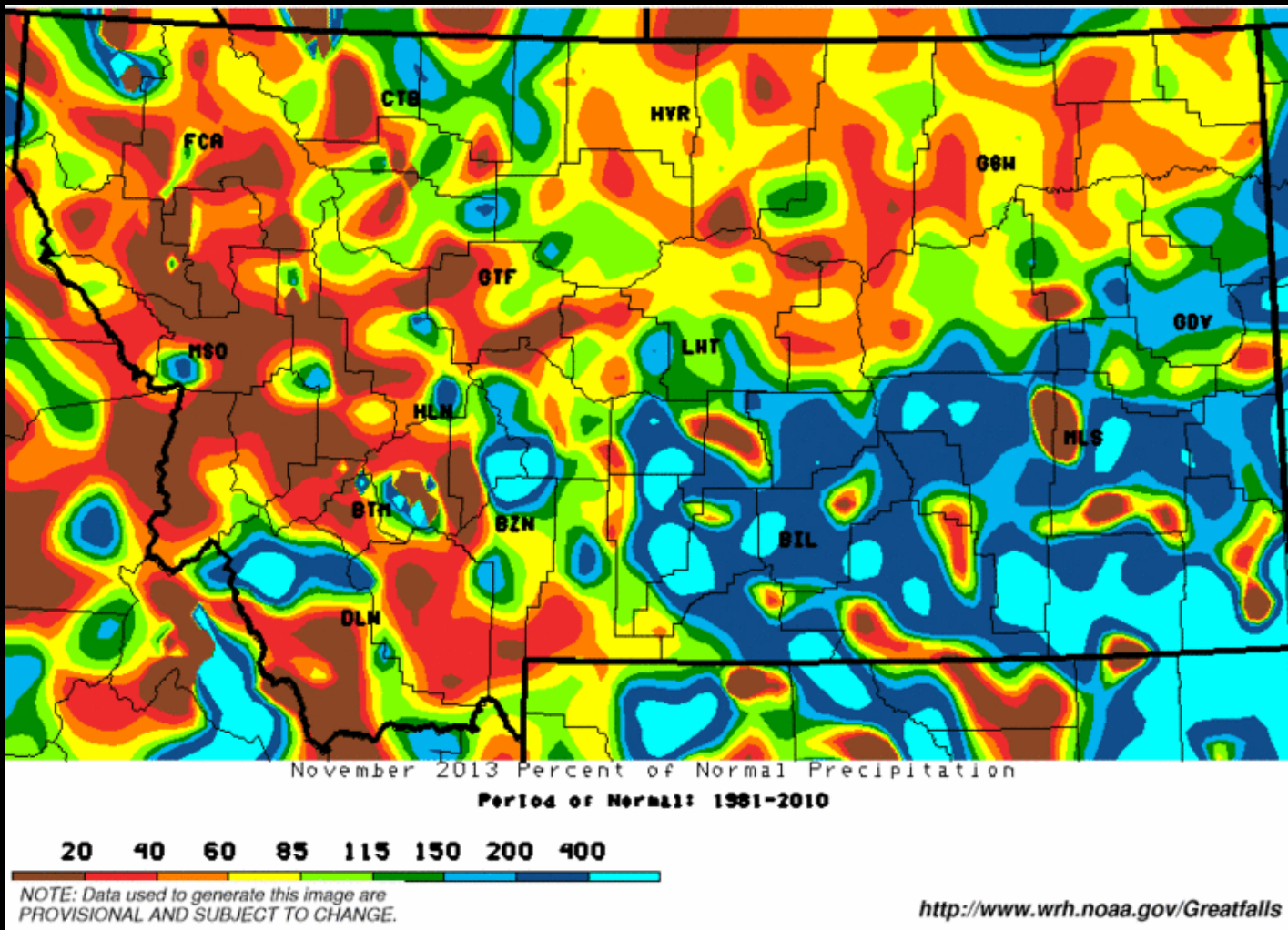
- Below to well below normal west, southwest, north-central and northeast
- Above to well above normal south-central and southeast



**NOAA - National Weather Service**

# Percent of Normal Precipitation November 2013

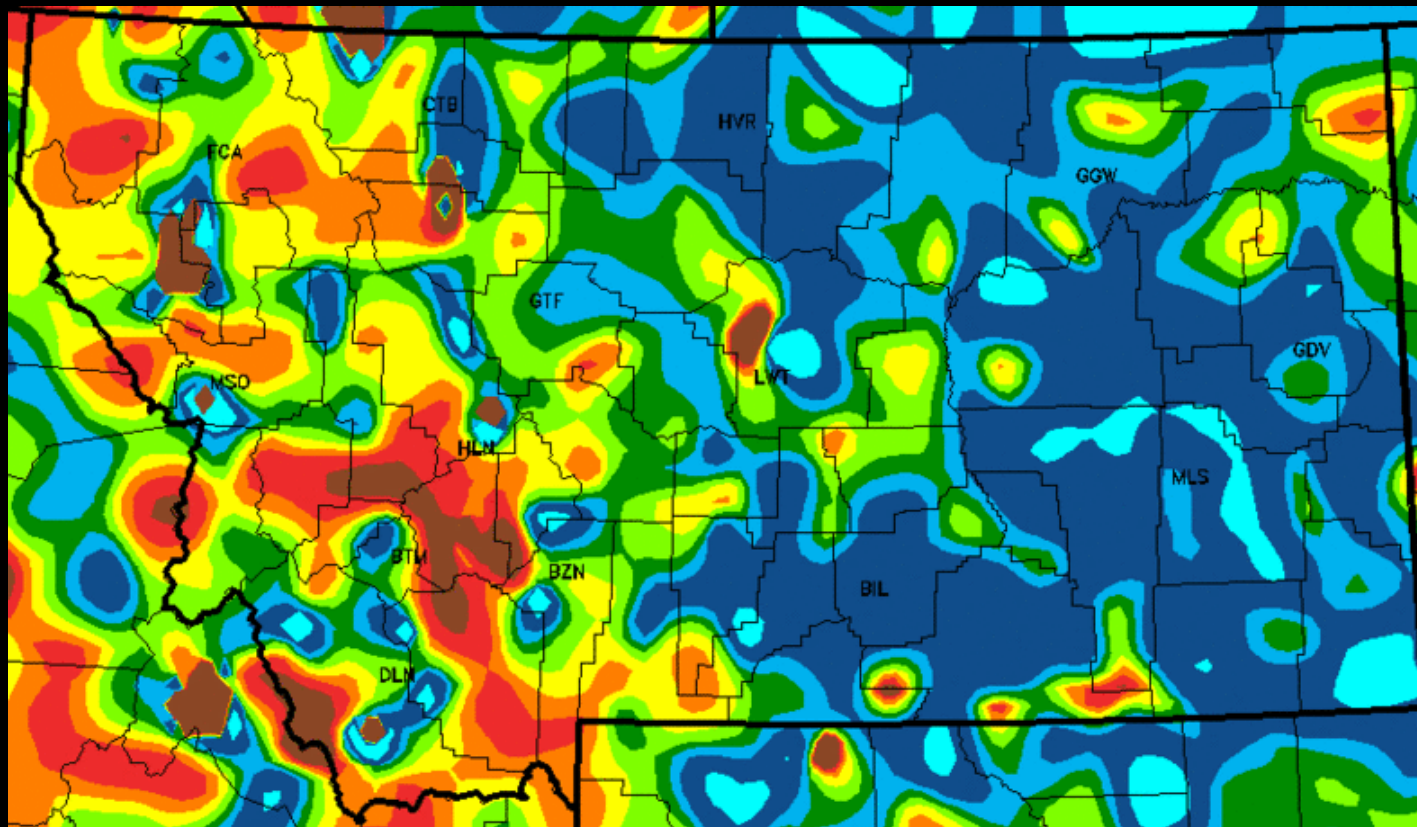
- Below to well below normal west, southwest, north-central and northeast
- Above to well above normal south-central and southeast



**NOAA - National Weather Service**

# Percent of Normal Precipitation December 2013

- Below to well below normal west and southwest
- Above to well above normal central and east



December 2013 Percent of Normal Precipitation

Period of Normal: 1981–2010

20 40 60 85 115 150 200 400

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.wrh.noaa.gov/Greatfalls>

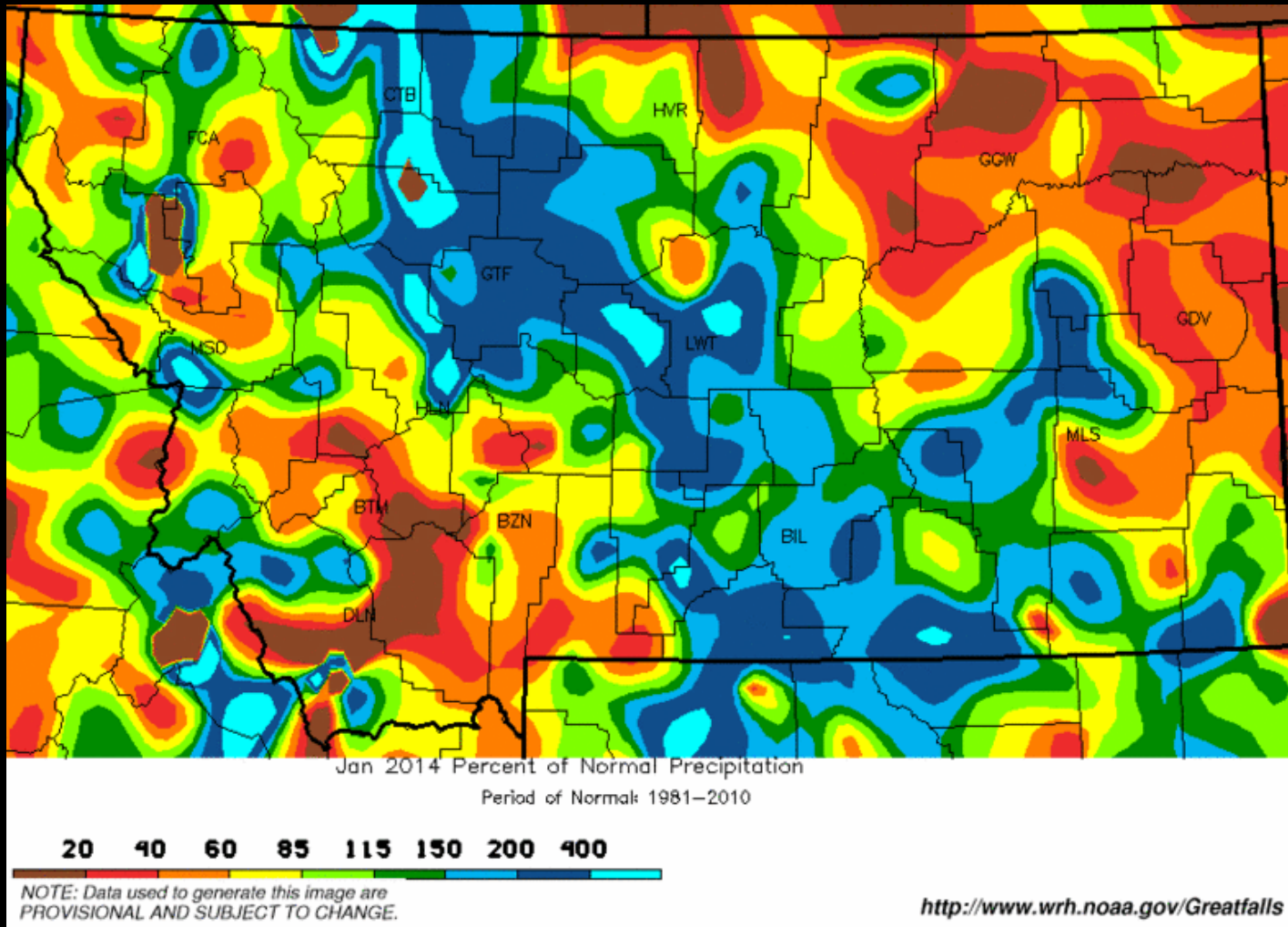


**NOAA - National Weather Service**



# Percent of Normal Precipitation January 2014

- Below to well below normal west, southwest, north-central and northeast
- Above to well above normal RMF, central, south-central

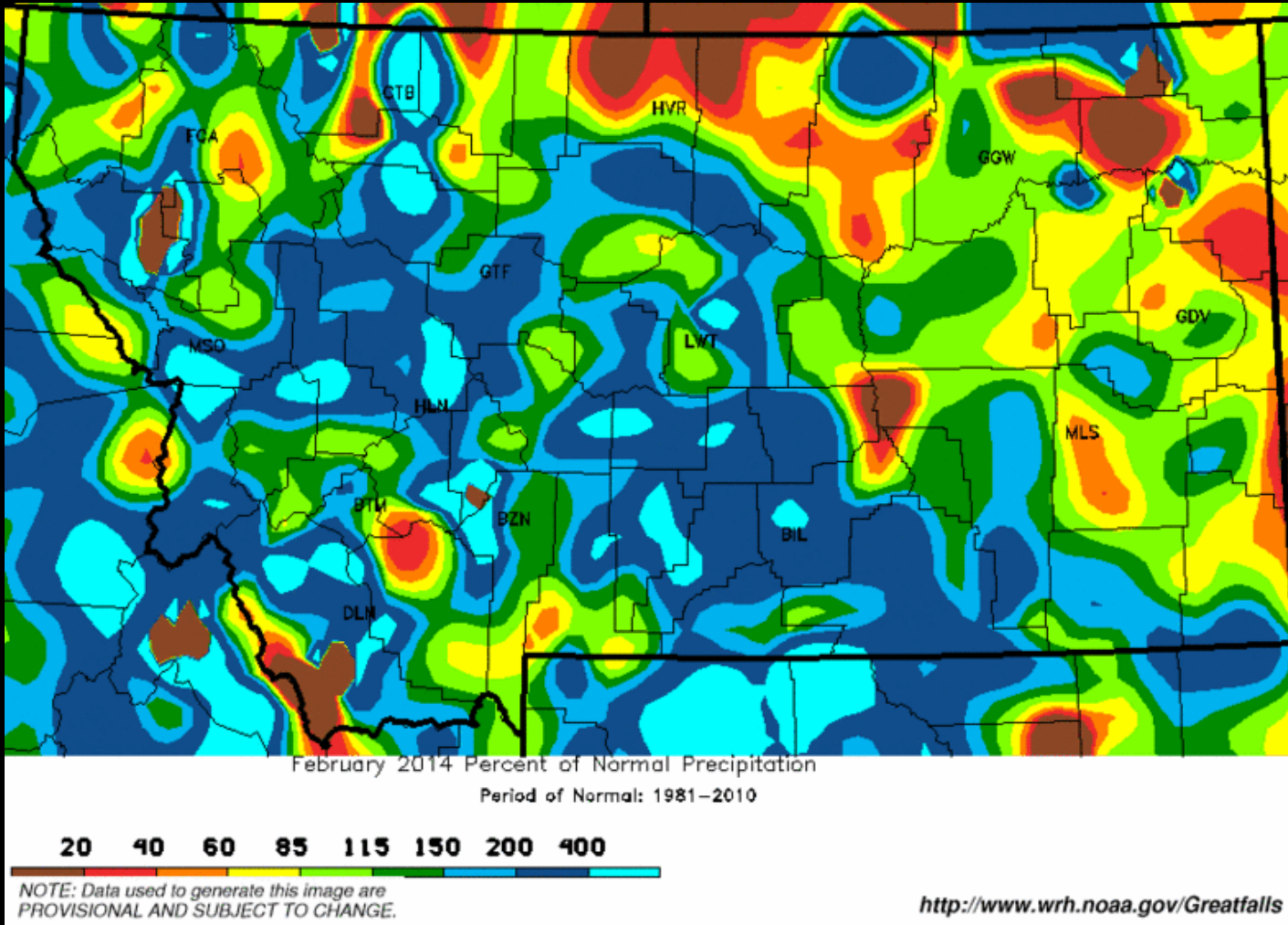


**NOAA - National Weather Service**



# Percent of Normal Precipitation February 2014

- Below to well below normal north-central and northeast
- Above to well above normal west, southwest, central, south-central and southeast

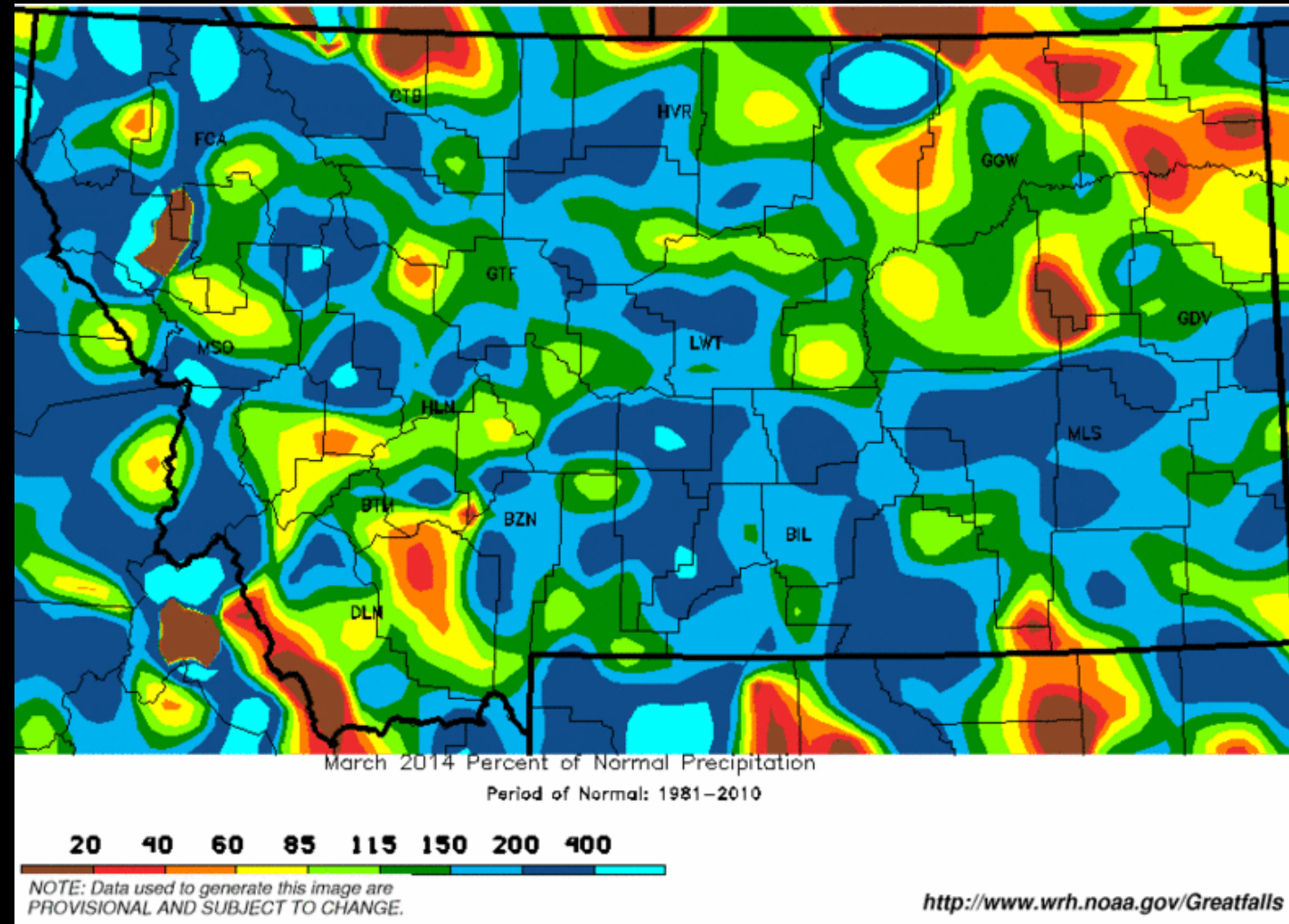


**NOAA - National Weather Service**

# Percent of Normal Precipitation

## March 2014

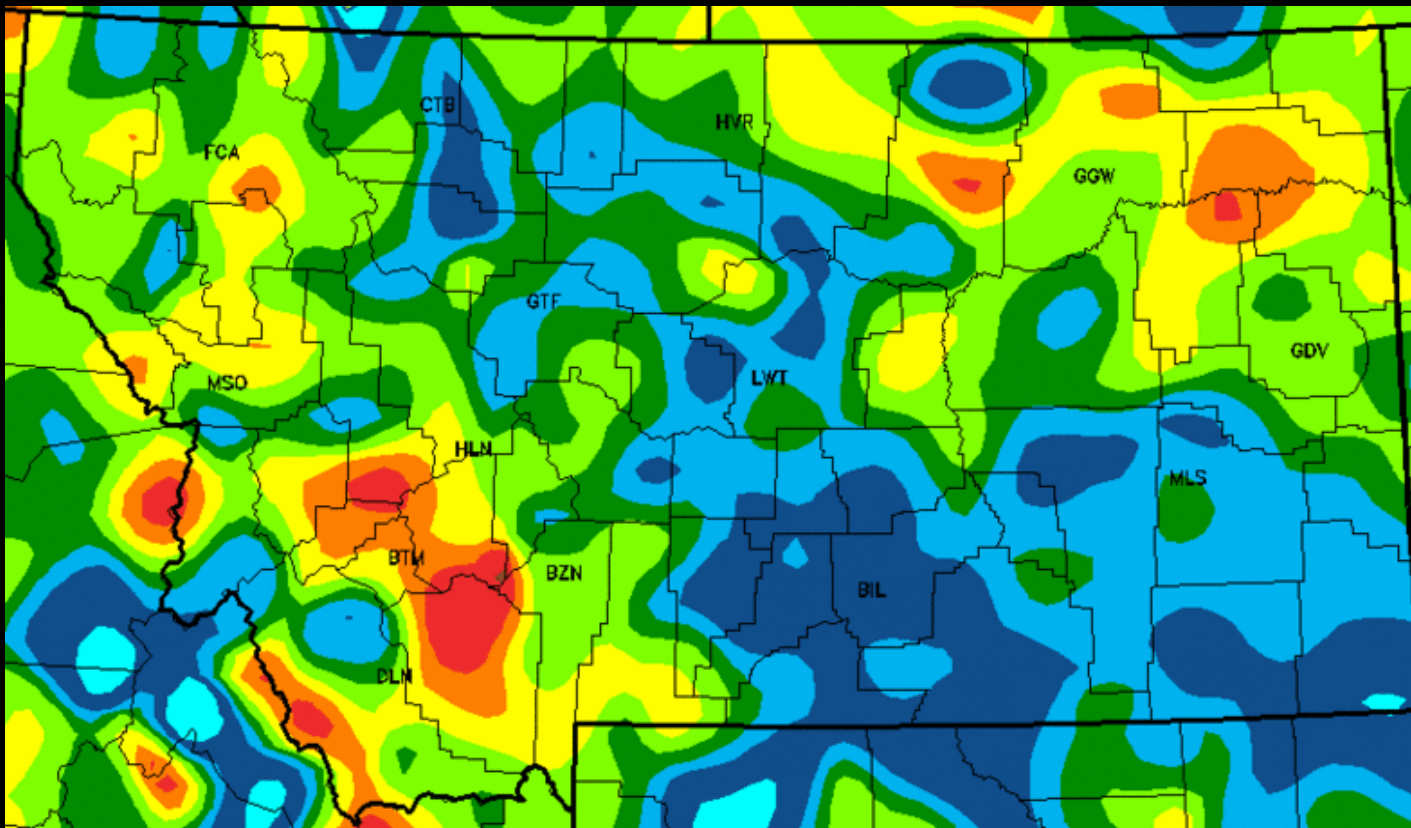
- Below to well below normal southwest and northeast
- Above to well above normal west, north-central, central, south-central and southeast



**NOAA - National Weather Service**

# Percent of Normal Precipitation Water Year 2014

- October - March
- Below to well below normal southwest and northeast
- Above to well above normal north-central, central, south-central and southeast



Oct 2013–Mar 2014 Percent of Normal Precipitation

Period of Normal: 1981–2010

20 40 60 85 115 150 200 400

NOTE: Data used to generate this image are  
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.wrh.noaa.gov/Greatfalls>



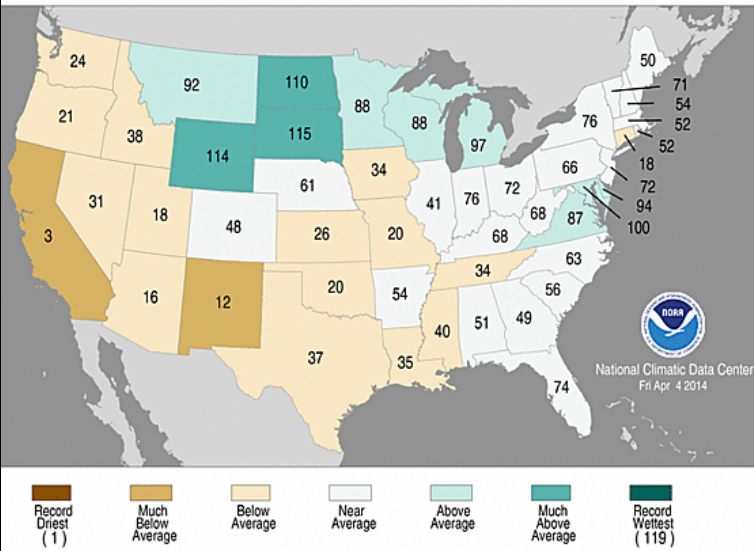
**NOAA - National Weather Service**



## Statewide Precipitation Ranks

October 2013–March 2014

Period: 1895–2014



## Water Year Rankings

28<sup>th</sup> wettest, 92<sup>nd</sup> driest,  
42<sup>nd</sup> coldest, 78<sup>th</sup> warmest

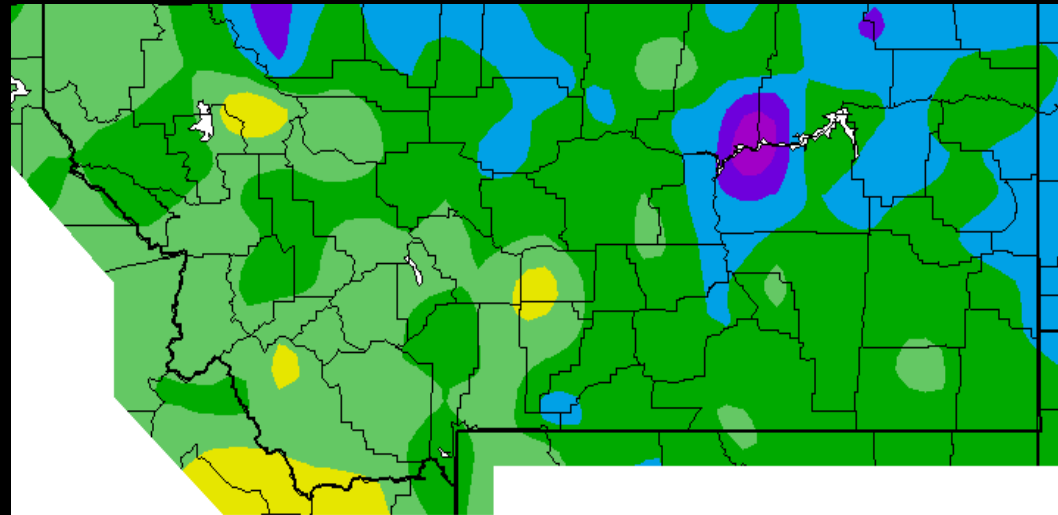
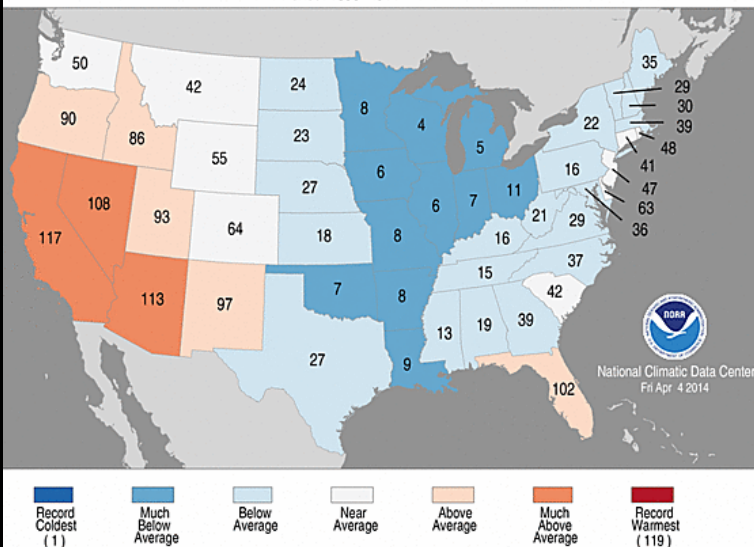
## Temperatures

Near to 4 degrees below normal west - southwest  
2 to 8 degrees below normal central - east

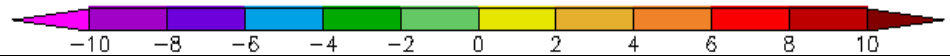
## Statewide Temperature Ranks

October 2013–March 2014

Period: 1895–2014



*Departure from average temperature*

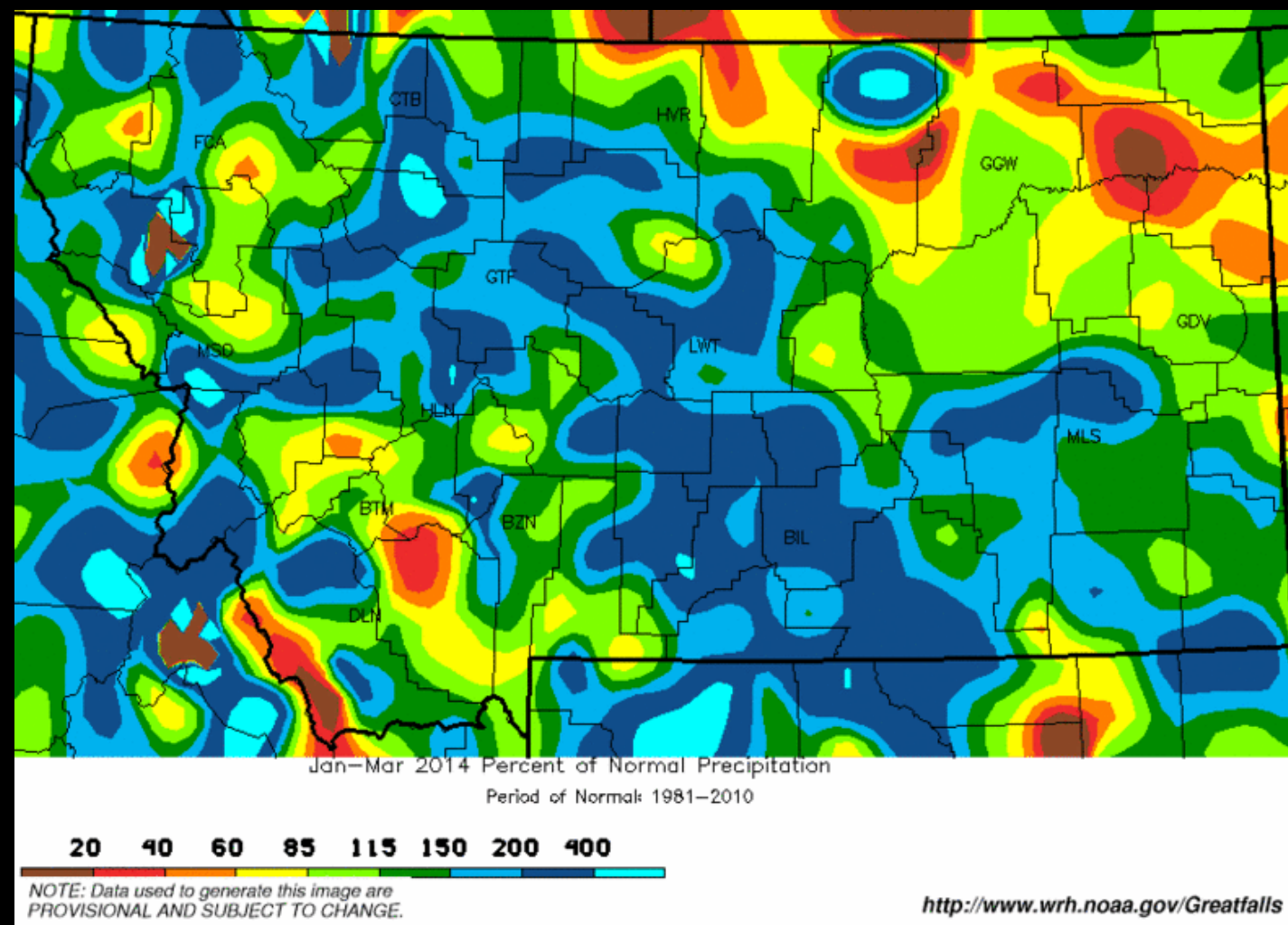


**NOAA - National Weather Service**



# Percent of Normal Precipitation Calendar Year

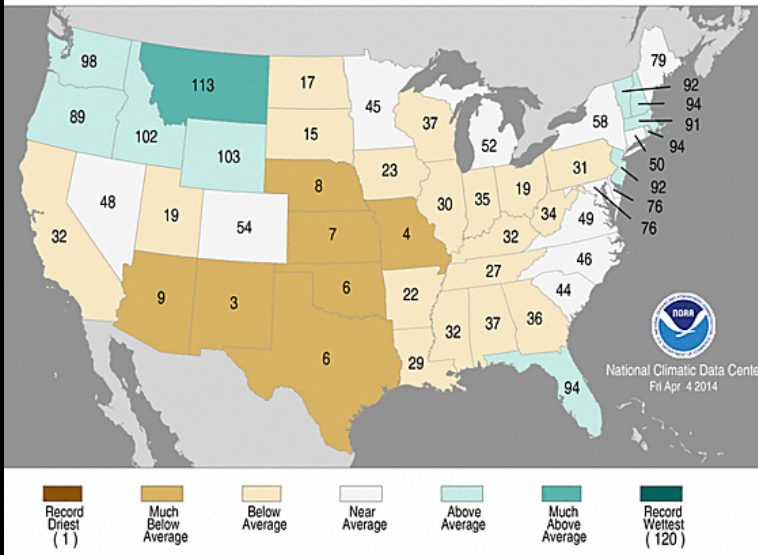
- January - March
- Below to well below normal southwest and northeast
- Above to well above normal west, north-central, central, south-central and southeast



## Statewide Precipitation Ranks

January–March 2014

Period: 1895–2014



## Calendar Year Rankings

8<sup>th</sup> wettest, 113<sup>th</sup> driest,  
59<sup>th</sup> warmest, 62<sup>nd</sup> coldest

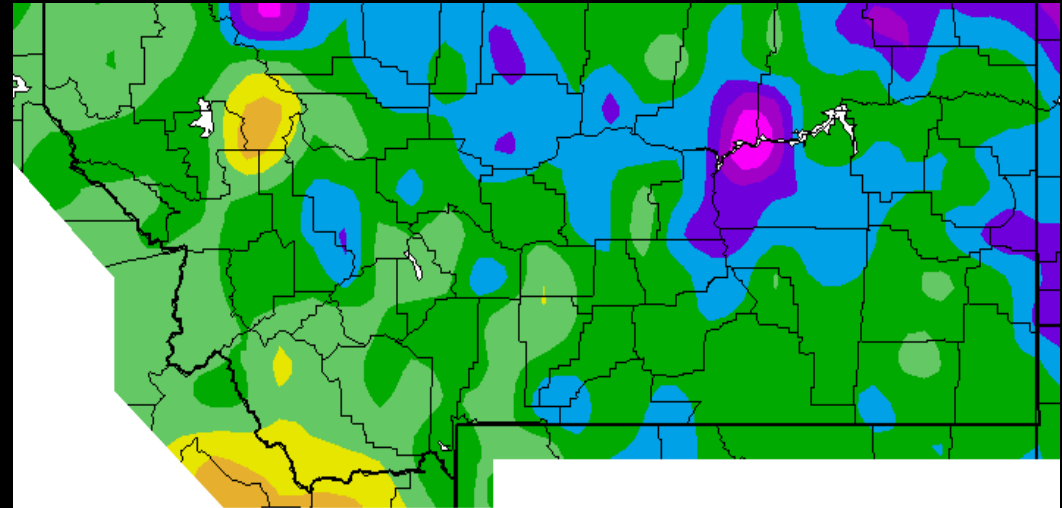
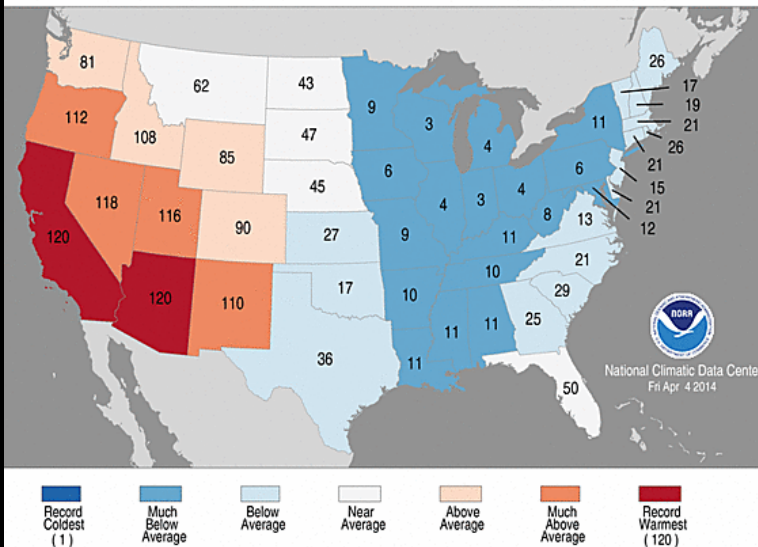
## Temperatures

Near to 4 degrees below normal west - southwest  
4 to 10 degree below normal central - east

## Statewide Temperature Ranks

January–March 2014

Period: 1895–2014



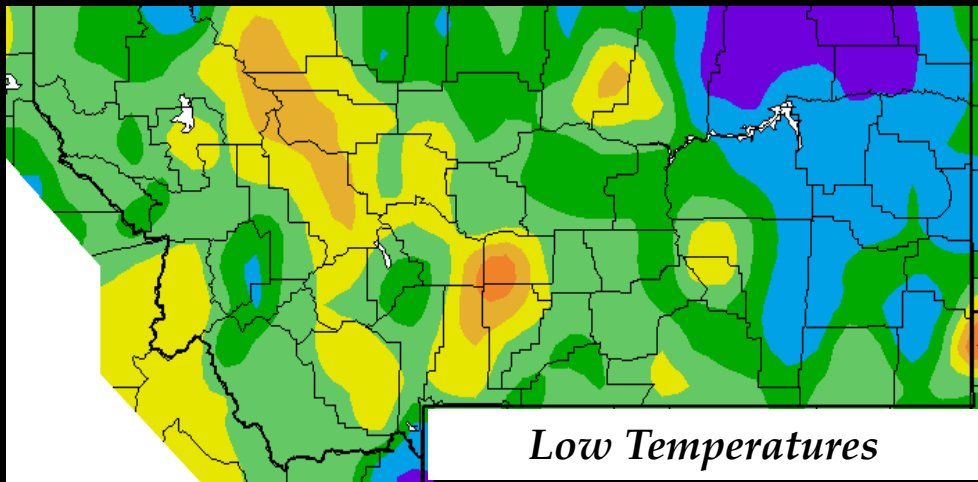
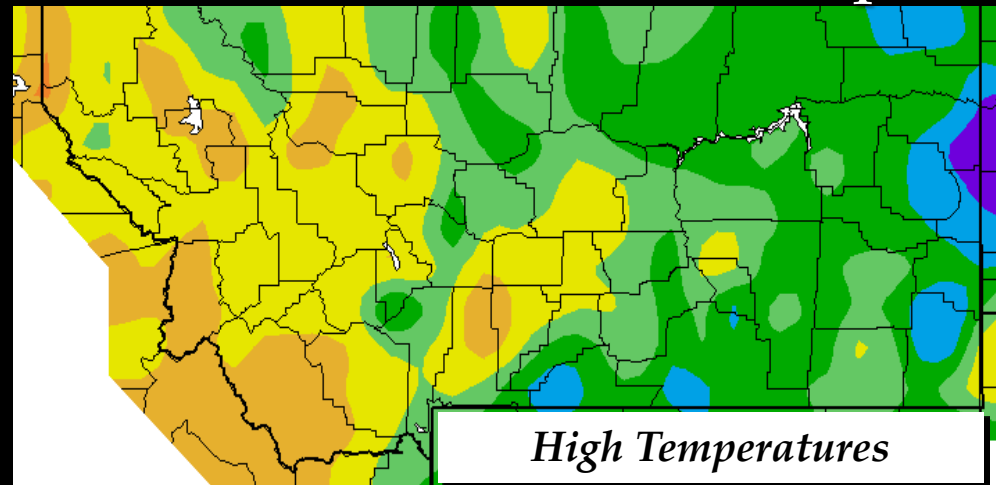
*Departure from average temperature*



**NOAA - National Weather Service**

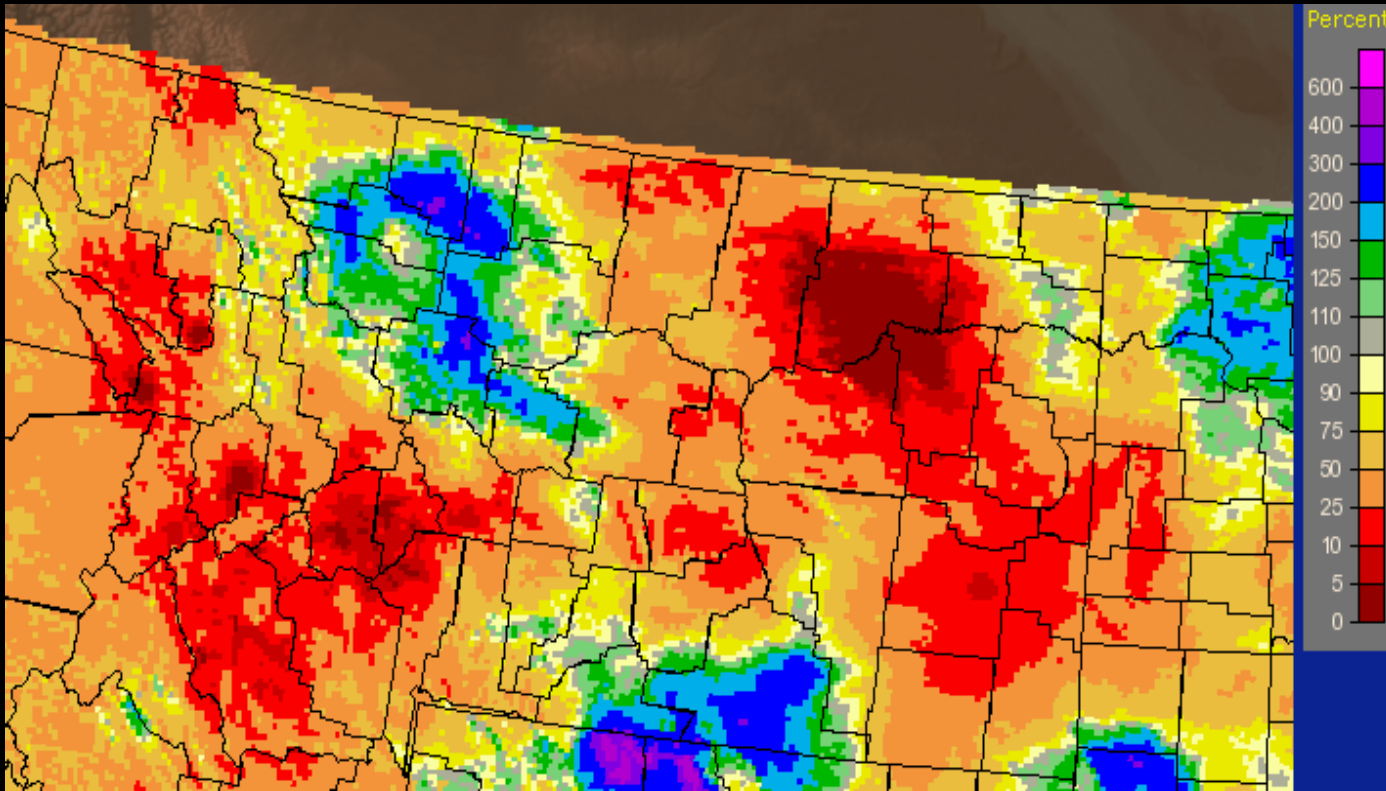
# Temperature Anomalies

April 1-14



- Highs
  - Near to 4 degrees above normal west-southwest
  - Near to 4 degrees below normal central-east
- Lows
  - Near to 4 degrees below normal west-central
  - 2 to 8 degrees below normal east

# Percent of Average Precipitation April 1–17

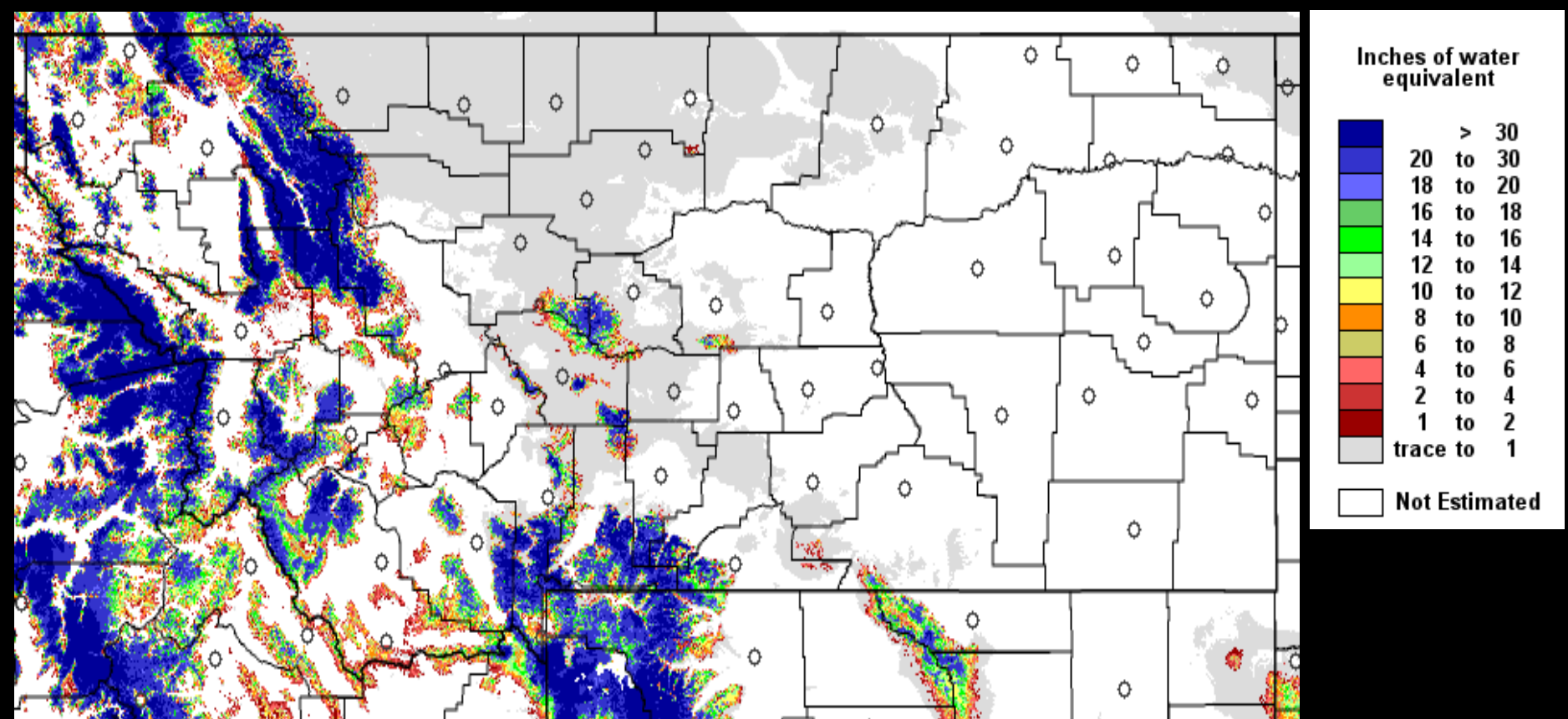


- Below to well below normal west, southwest, central, northeast, southeast
- Above to well above normal RMF, south-central



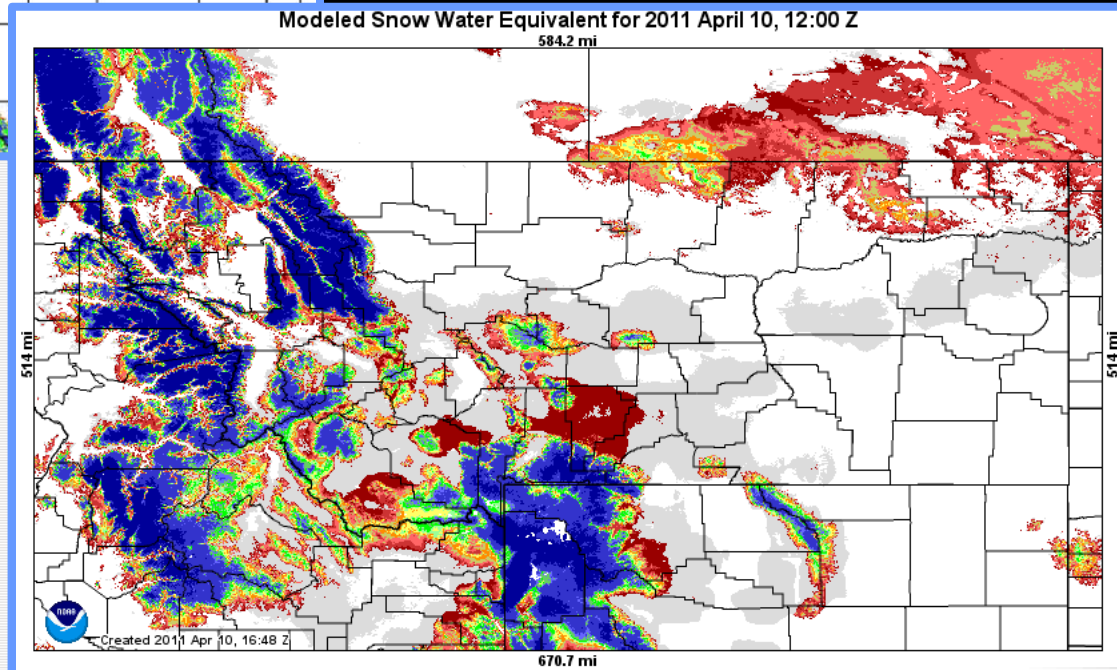
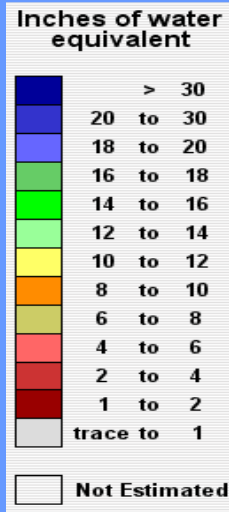
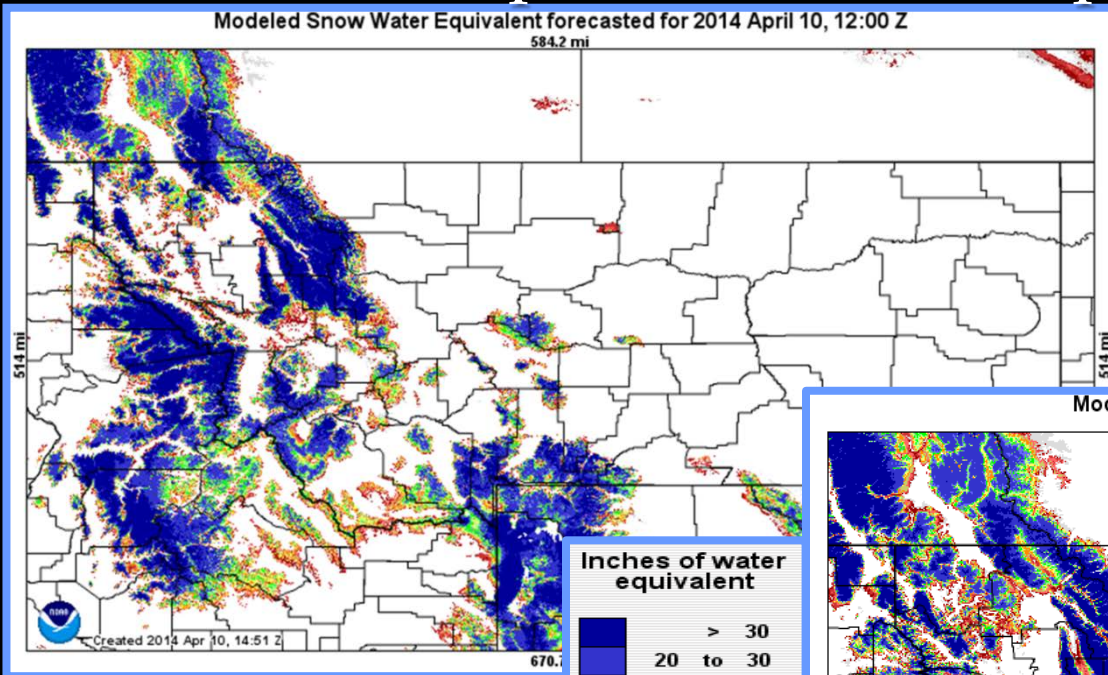
# NOHRSC Modeled Snow Water Equivalent

April 17, 2014

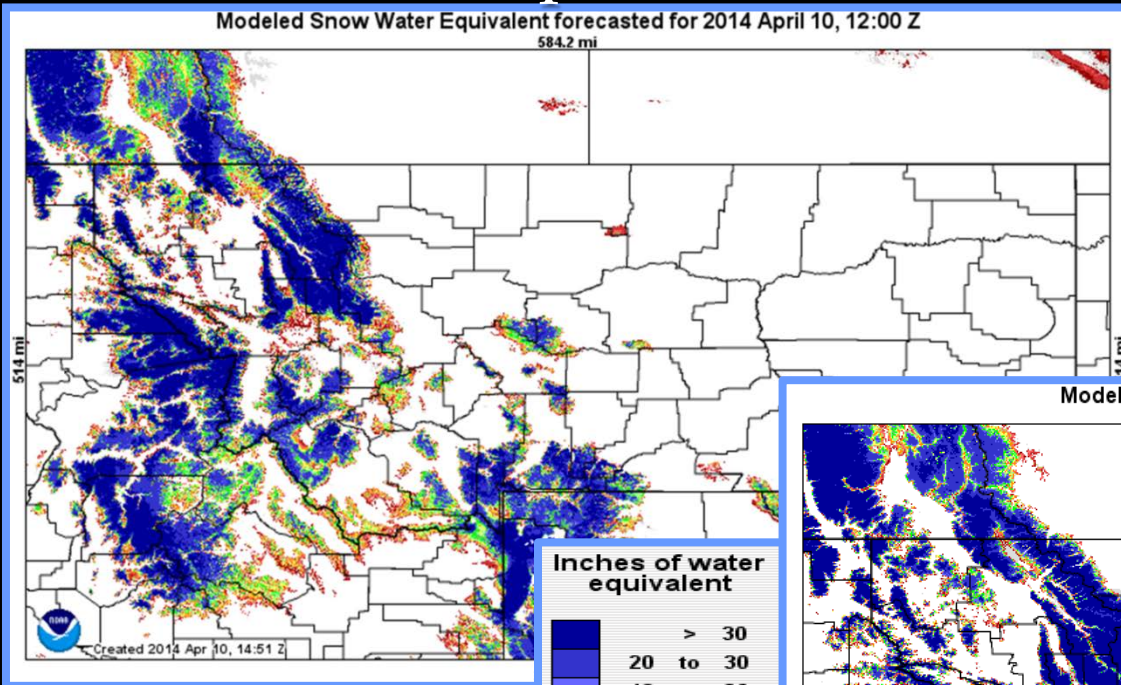


*NOAA - National Weather Service*

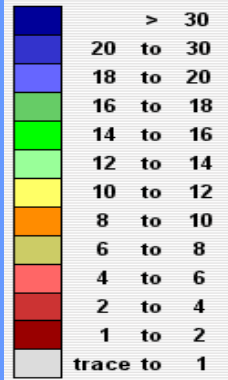
# NOHRSC Modeled Snow Water Equivalent April 10, 2014 vs April 10, 2011



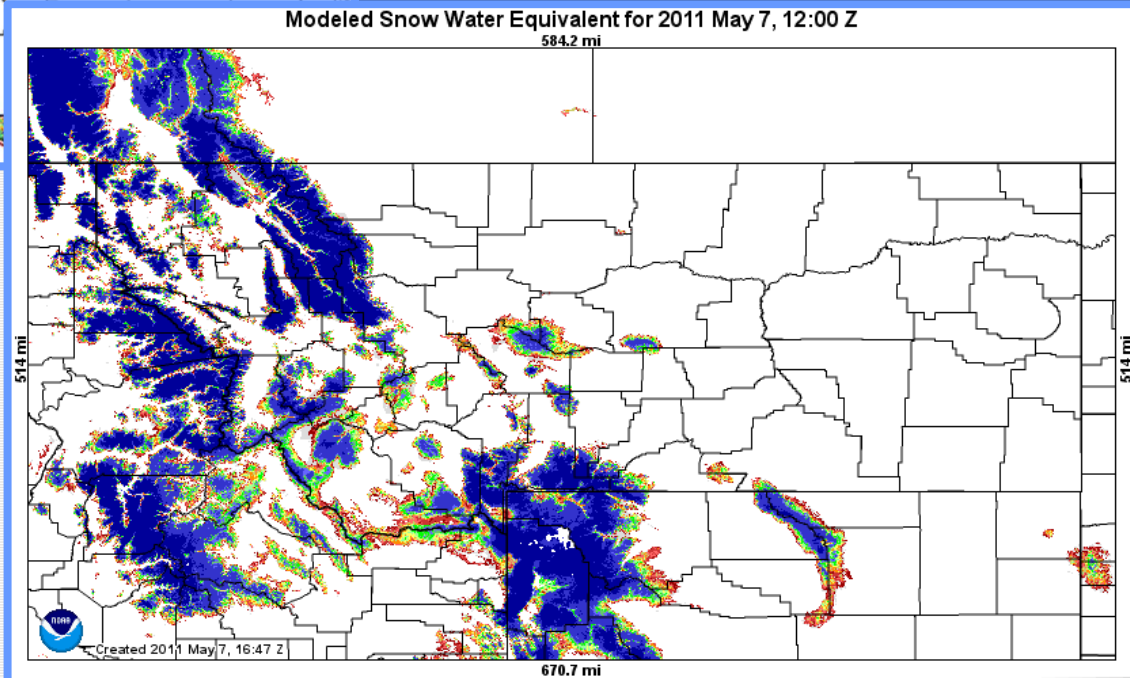
# NOHRSC Modeled Snow Water Equivalent April 10, 2014 vs May 7, 2011



Inches of water equivalent



Not Estimated



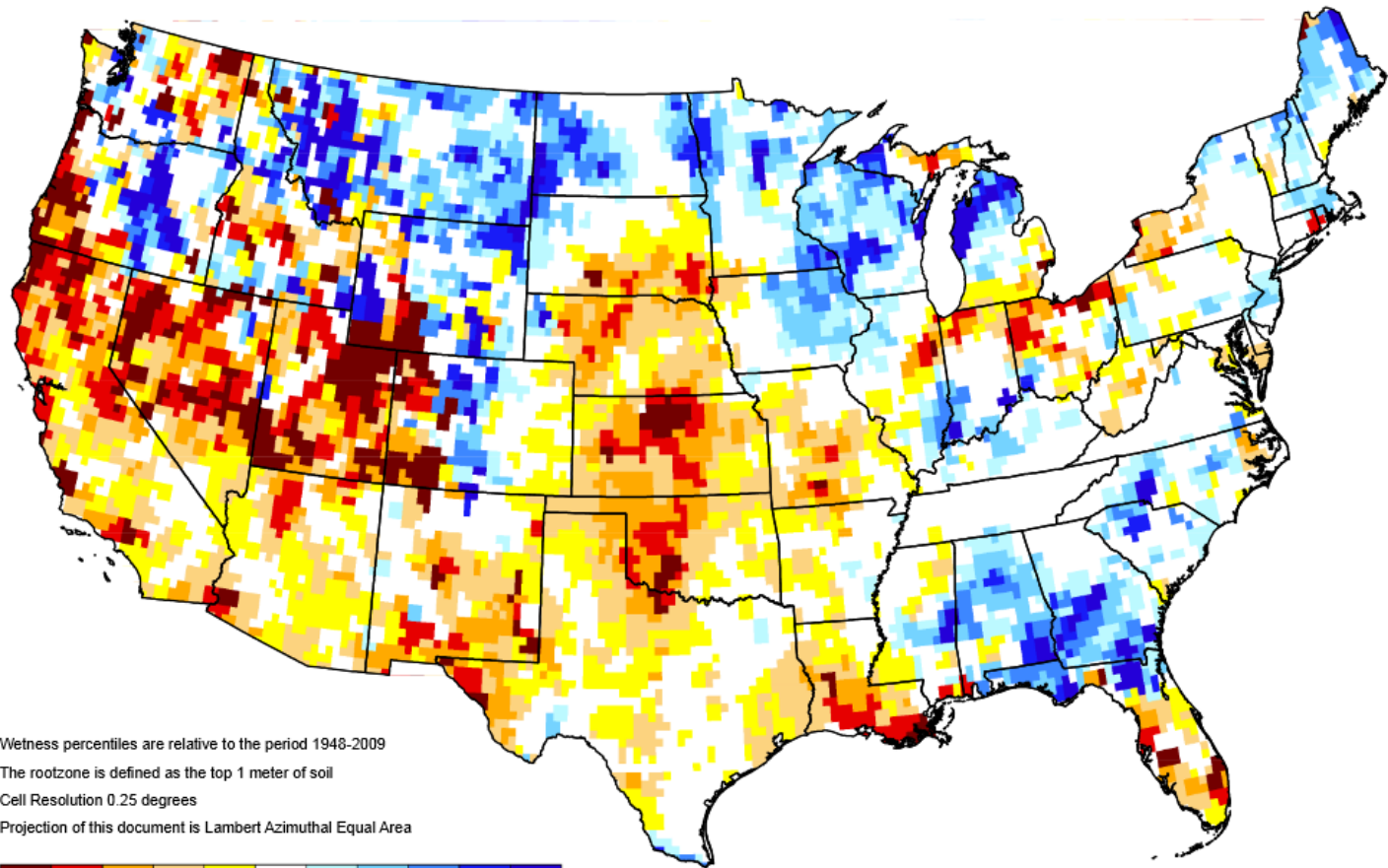


# Soil Moisture – Upper 1 Meter



## GRACE-Based Root Zone Soil Moisture Drought Indicator

April 14, 2014

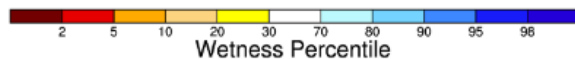


Wetness percentiles are relative to the period 1948-2009

The rootzone is defined as the top 1 meter of soil

Cell Resolution 0.25 degrees

Projection of this document is Lambert Azimuthal Equal Area



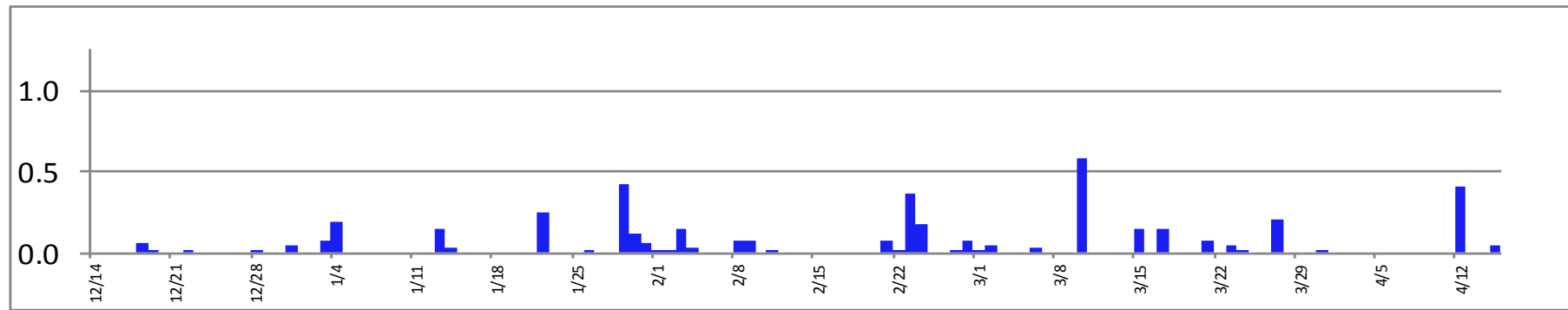
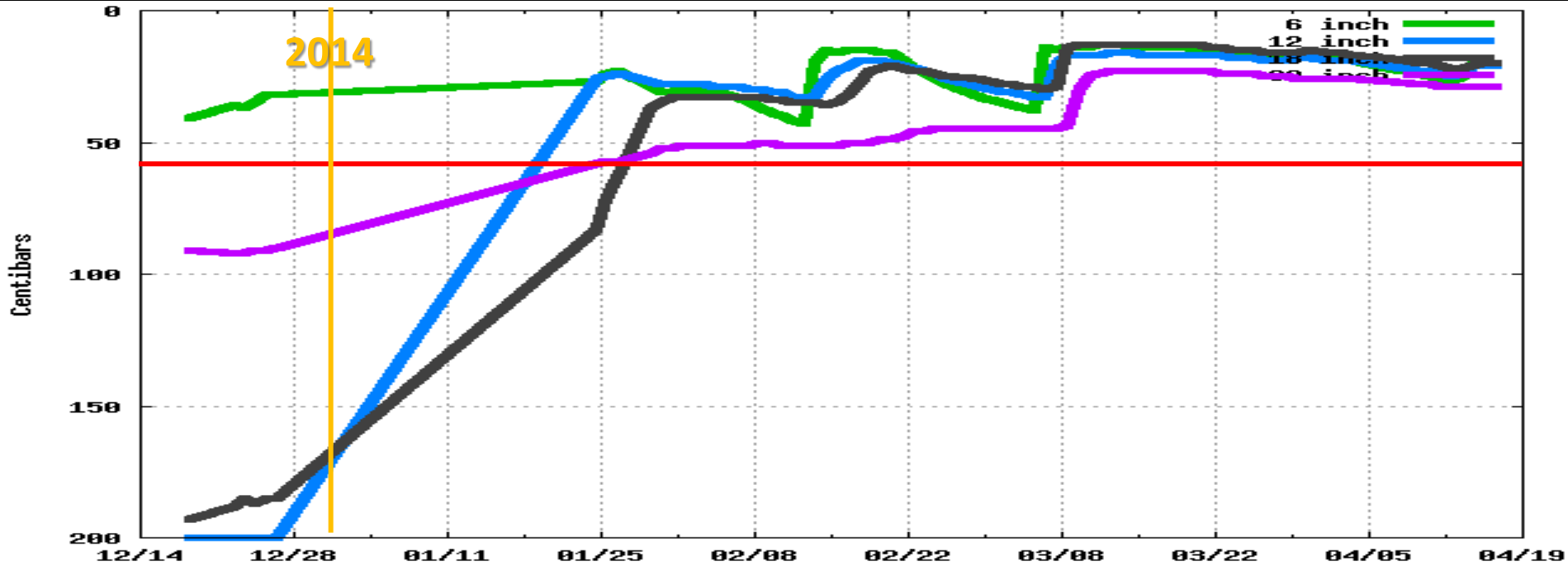
<http://drought.unl.edu/MonitoringTools/NASAGRACEDataAssimilation.aspx>



**NOAA - National Weather Service**



# Great Falls Soil Moisture



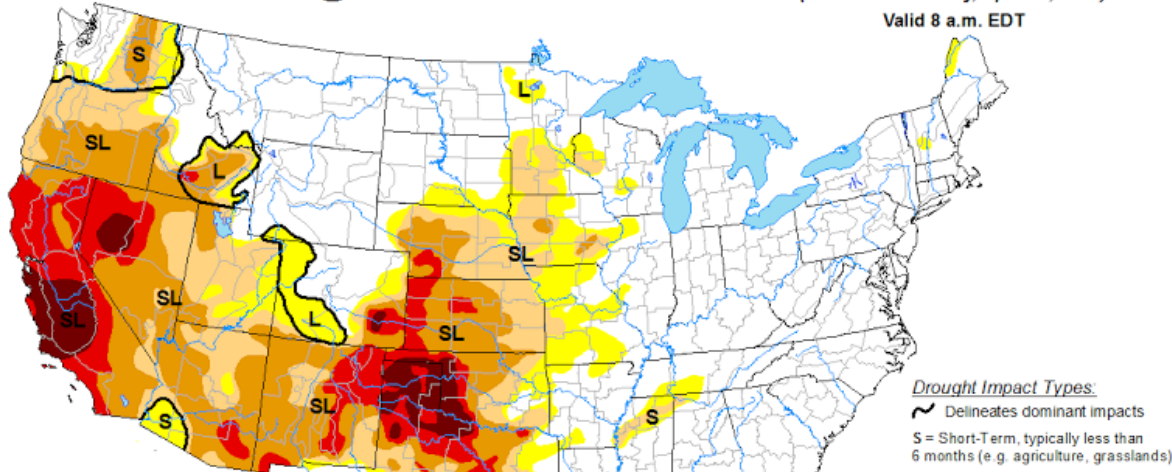
**NOAA - National Weather Service**

# National Drought Monitor

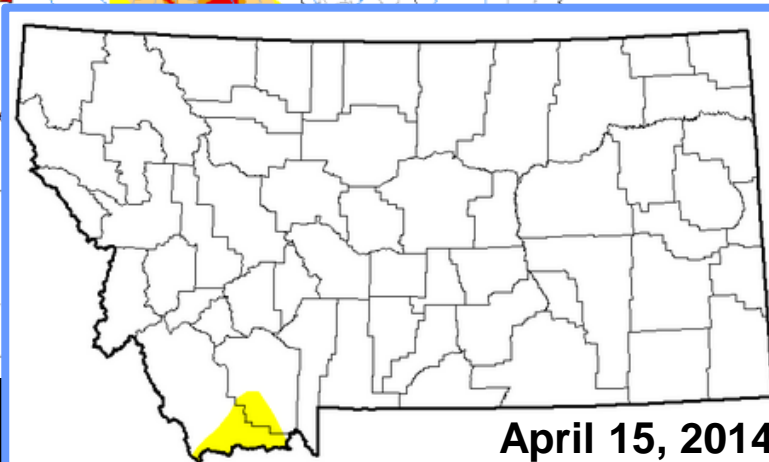
## Issued April 18

### U.S. Drought Monitor

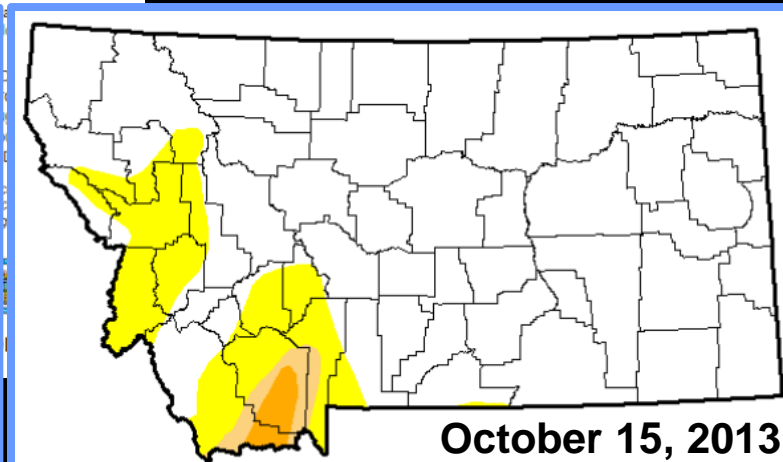
April 15, 2014  
(Released Thursday, April 17, 2014)  
Valid 8 a.m. EDT



Author:  
Brian Fuchs  
National Drought Mitigation Center



April 15, 2014



October 15, 2013

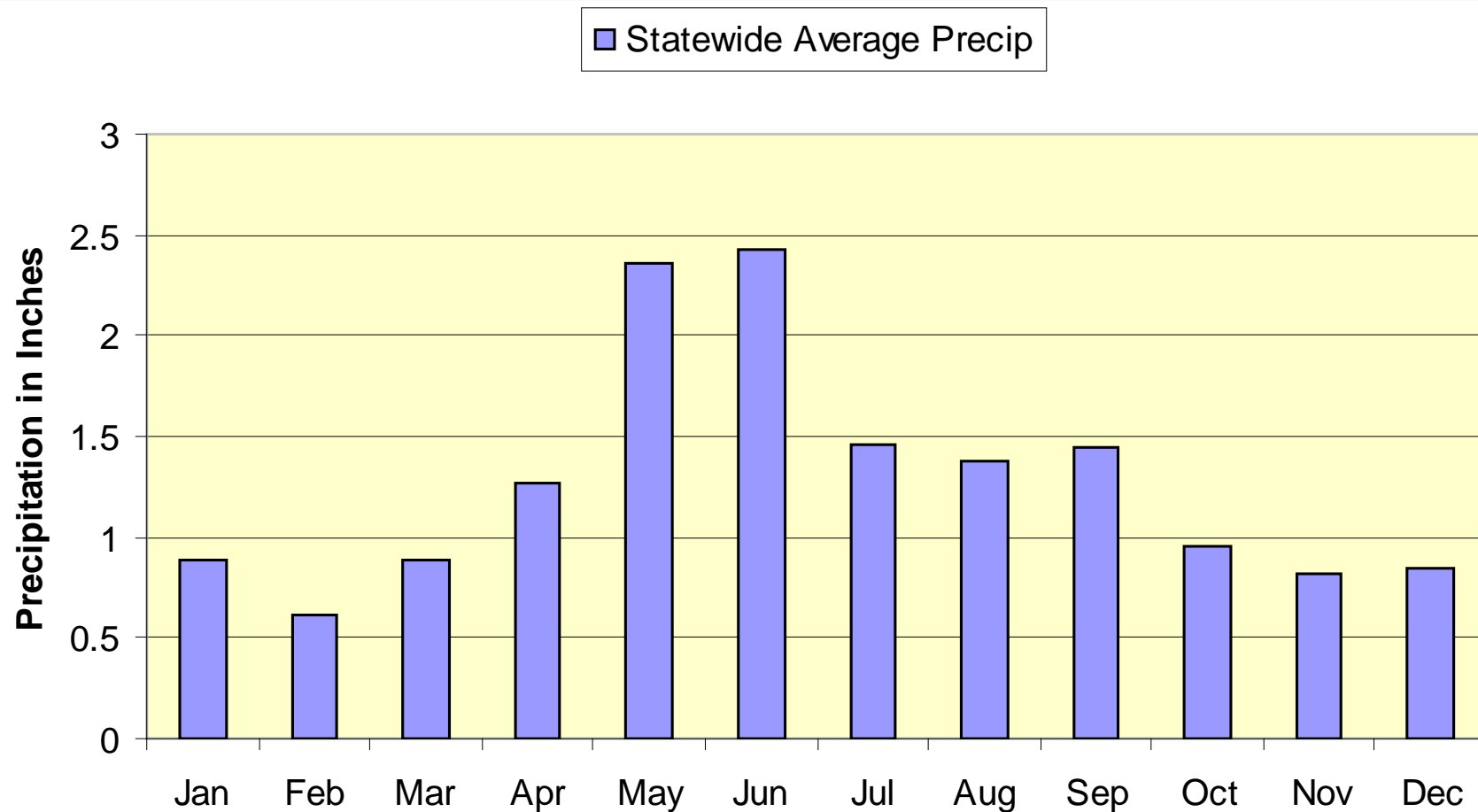
- 'Abnormally Dry' far southwest Montana



NOAA - National Weather Service

# Statewide Average Precipitation

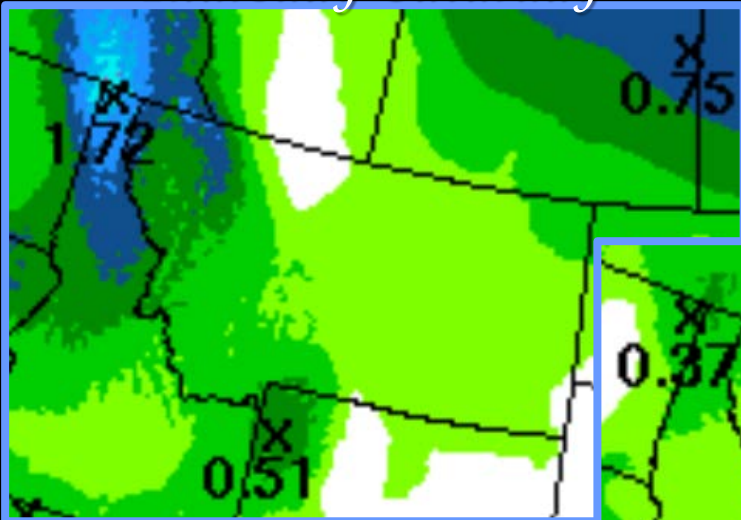
## April starts upswing in spring precipitation



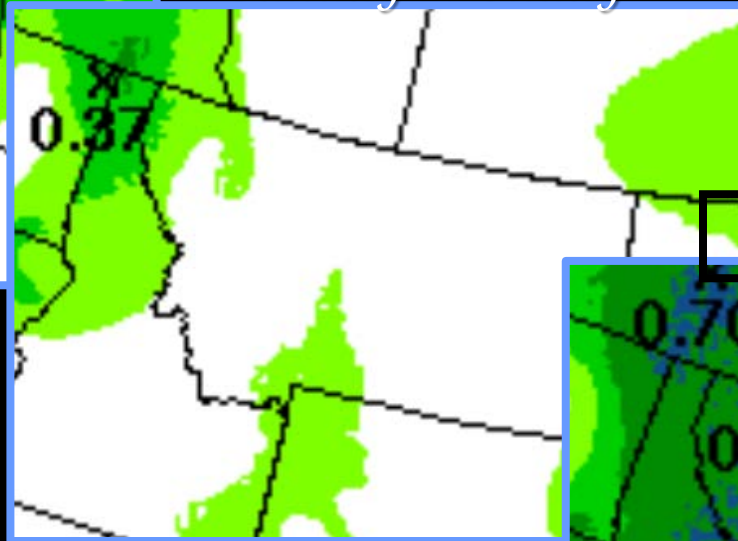
***NOAA - National Weather Service***

# 7-Day Precipitation Forecast

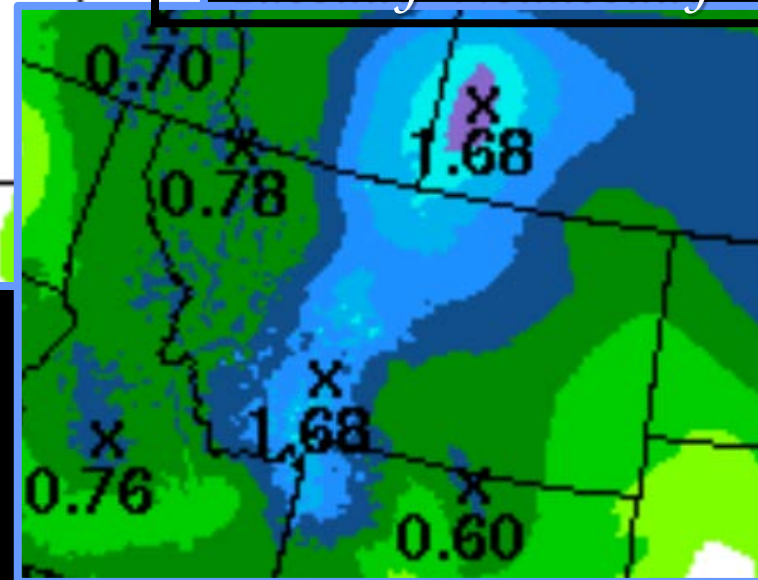
*Thursday-Saturday*



*Sunday-Monday*



*Tuesday-Wednesday*



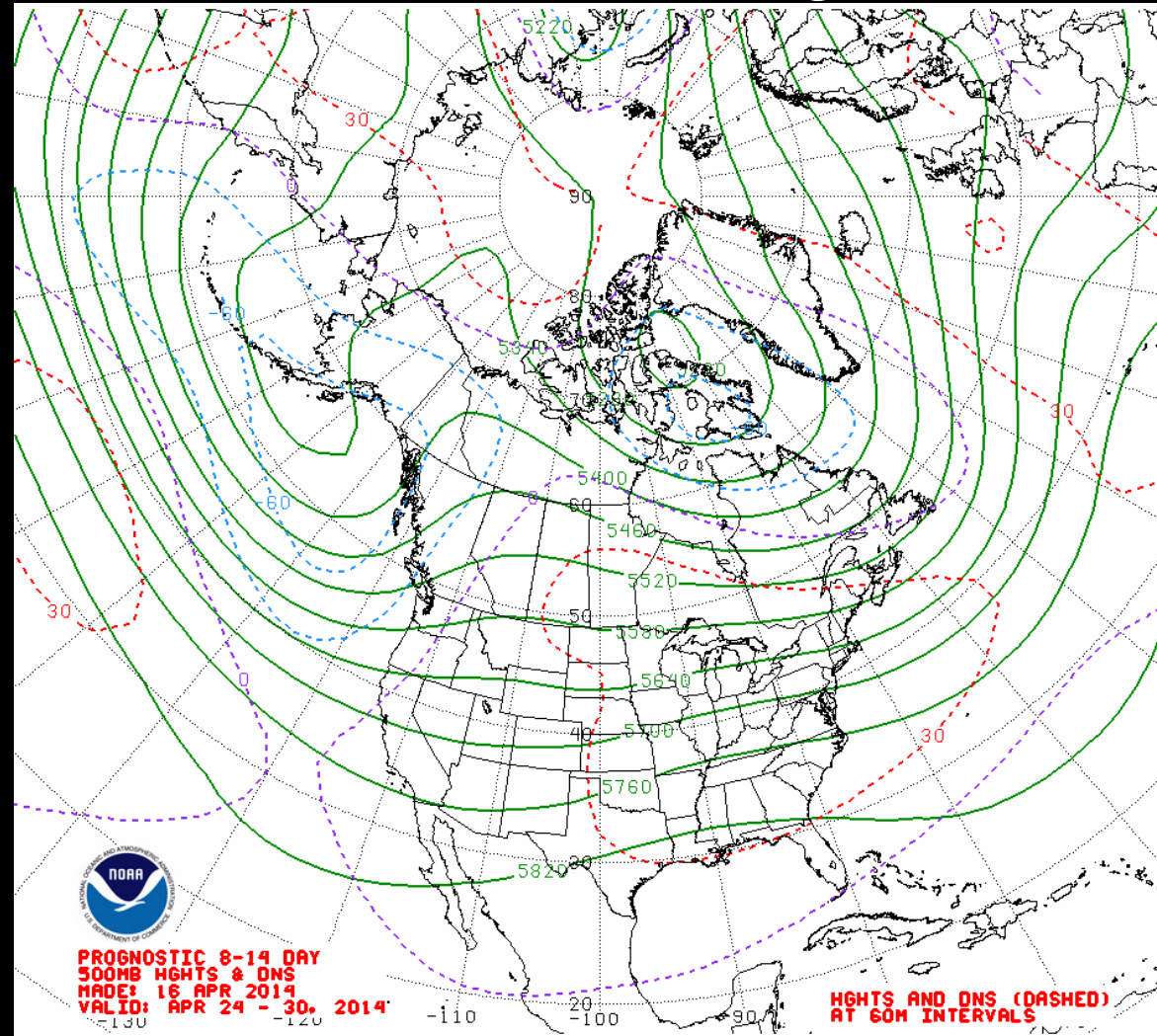
*NOAA - National Weather Service*



# 8 to 14 Day Outlook

## 500mb Heights and Anomalies

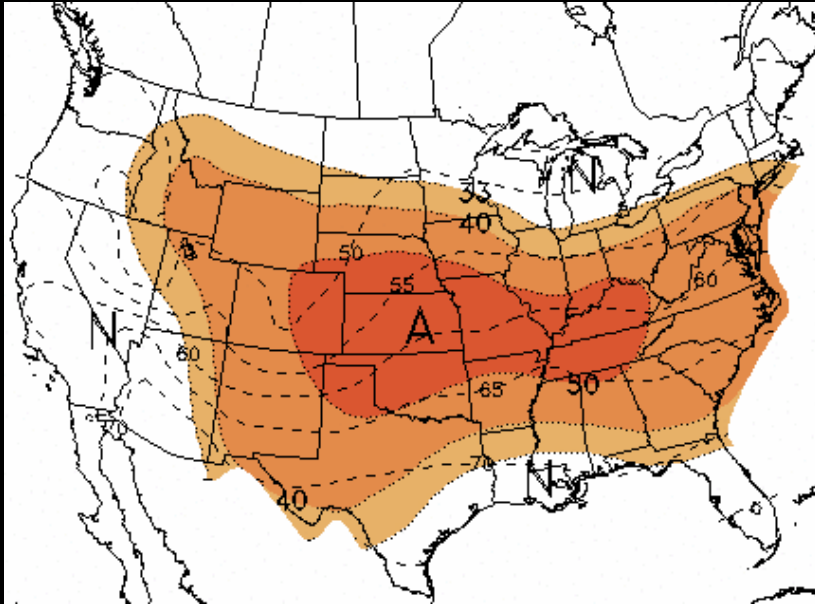
- April 24 - 30
- Westerly flow over Montana with approaching low pressure trough



# 8 to 14 Day Outlook

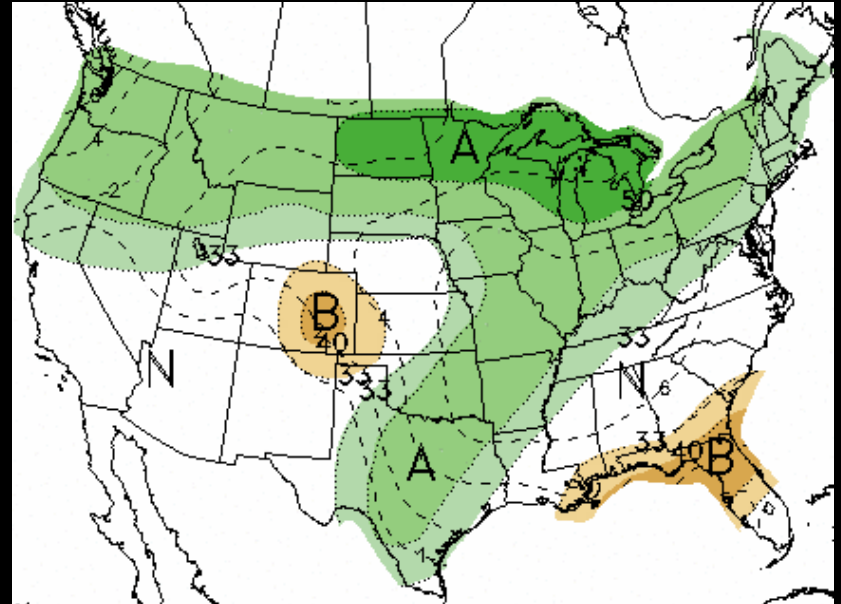
April 24 - 30

## *Temperature*



- 33% to 50% chance temperatures will be above normal over central and southern Montana

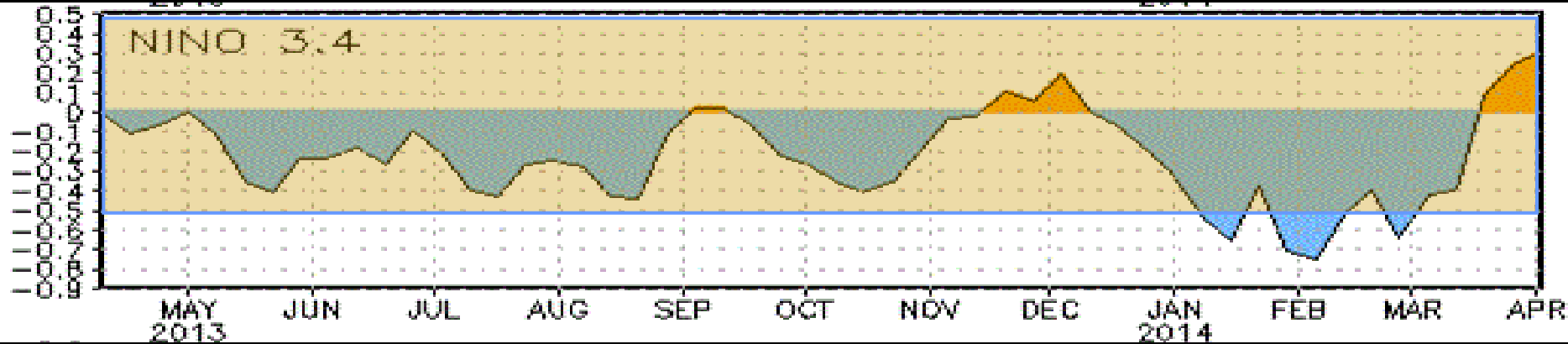
## *Precipitation*



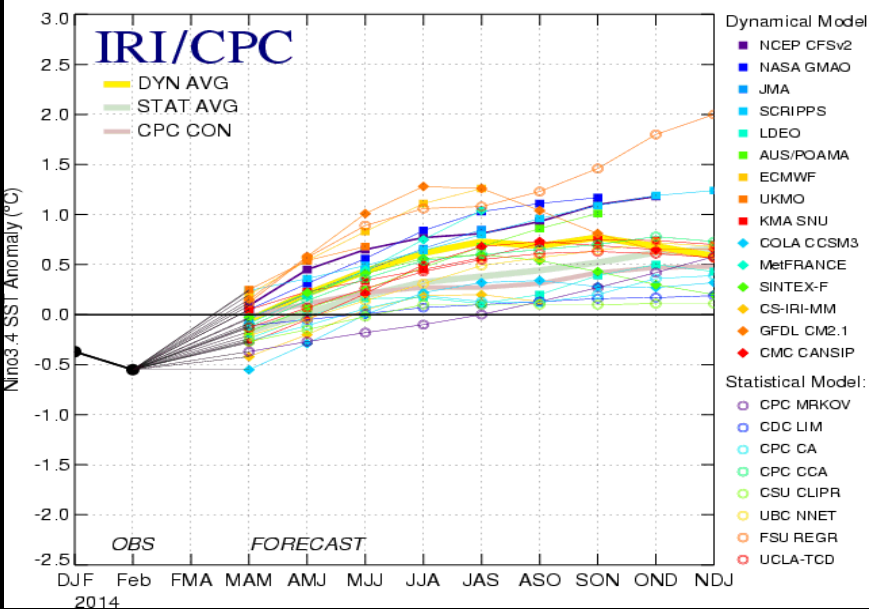
- 40% to 50% chance precipitation will be above normal across Montana

# El Niño / La Niña

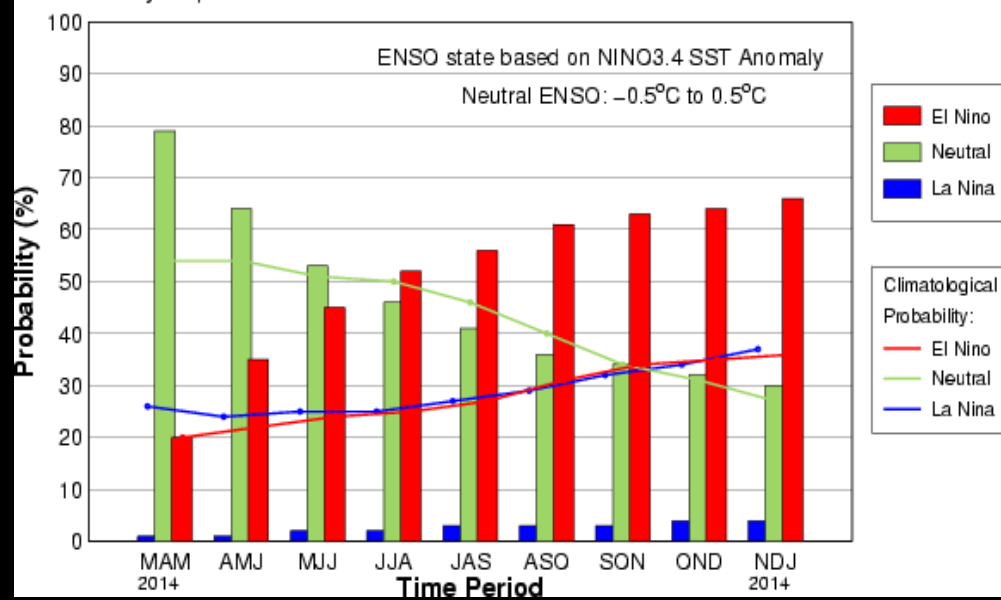
*El Niño Watch* - Chances of El Niño increase during the remainder of the year



Mid-Mar 2014 Plume of Model ENSO Predictions



Early-Apr CPC/IRI Consensus Probabilistic ENSO Forecast

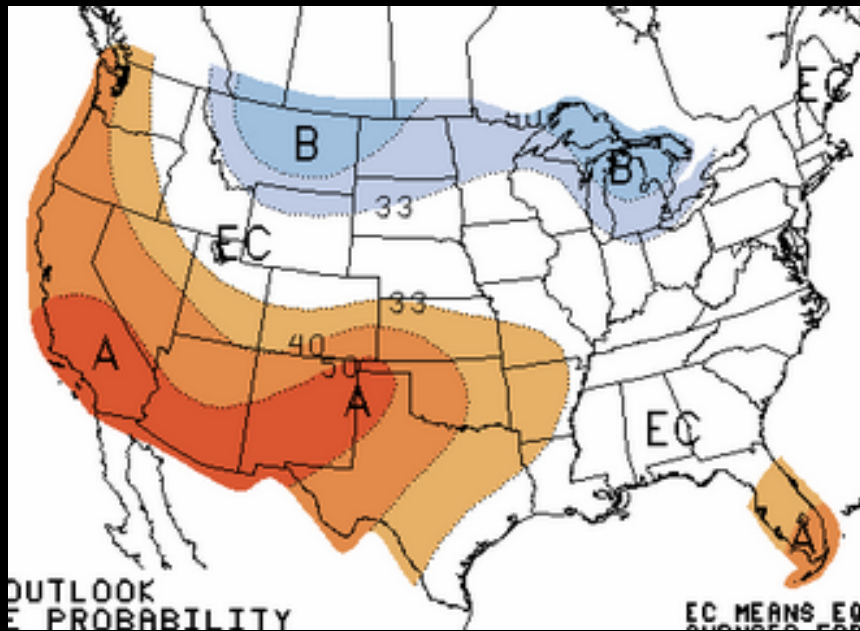


**NOAA - National Weather Service**

# May Outlook

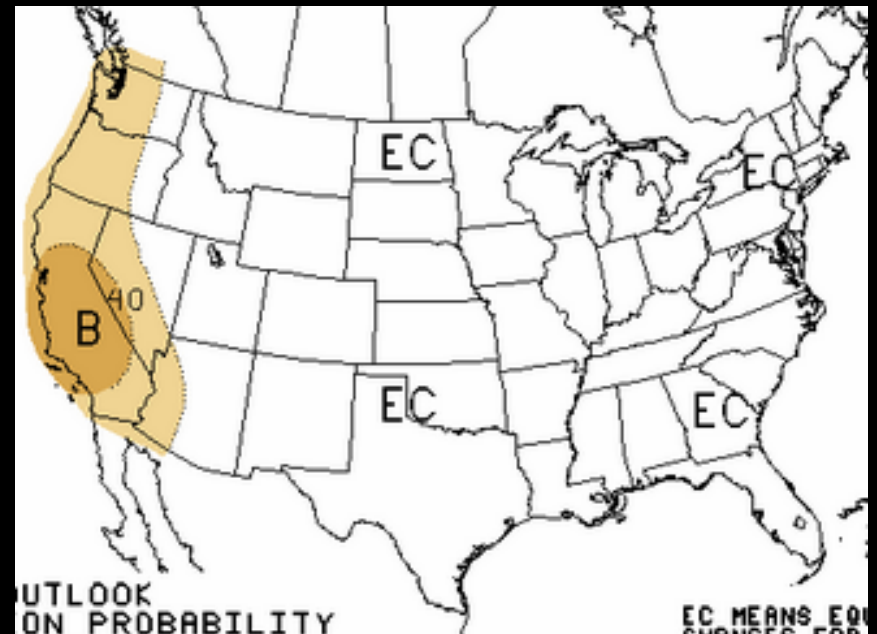
## Updated April 17

### *Temperature*



- 33% to 50% chance precipitation will be below normal across Montana

### *Precipitation*



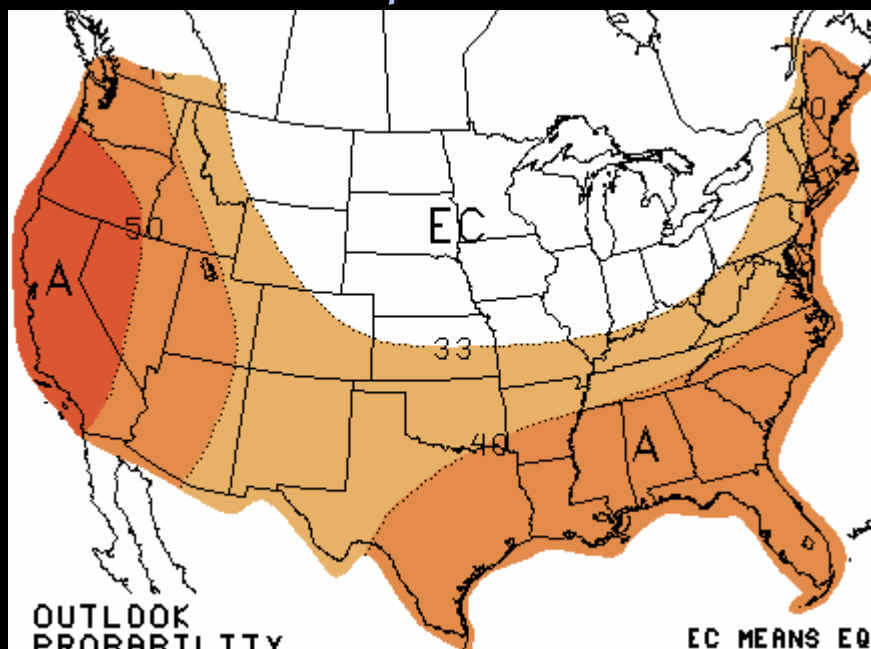
- Equal chances precipitation will be above, below, or near normal over across Montana



# June – August Outlook

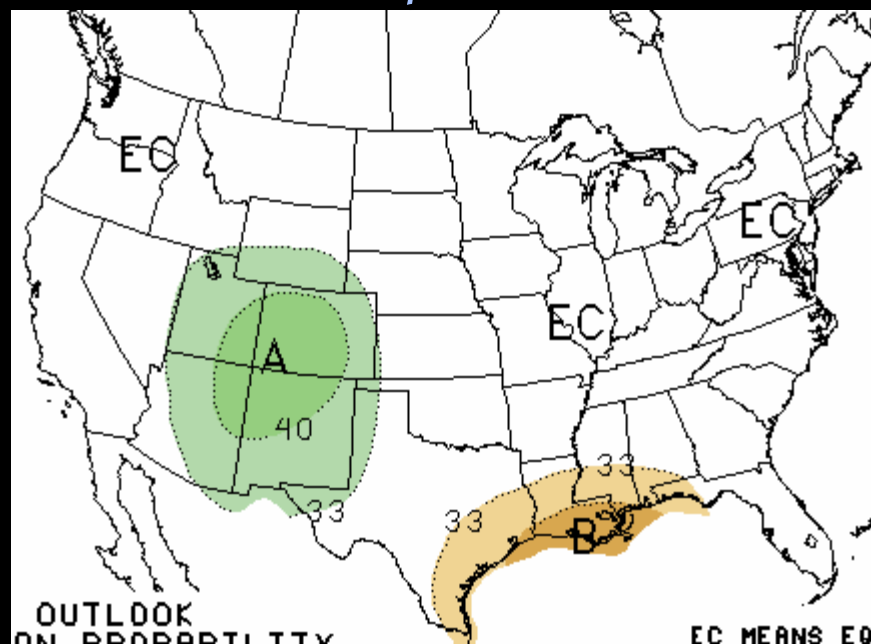
## Updated April 17

### *Temperature*



- 33% to 40% chance temperatures will be above normal over west and southwest Montana

### *Precipitation*

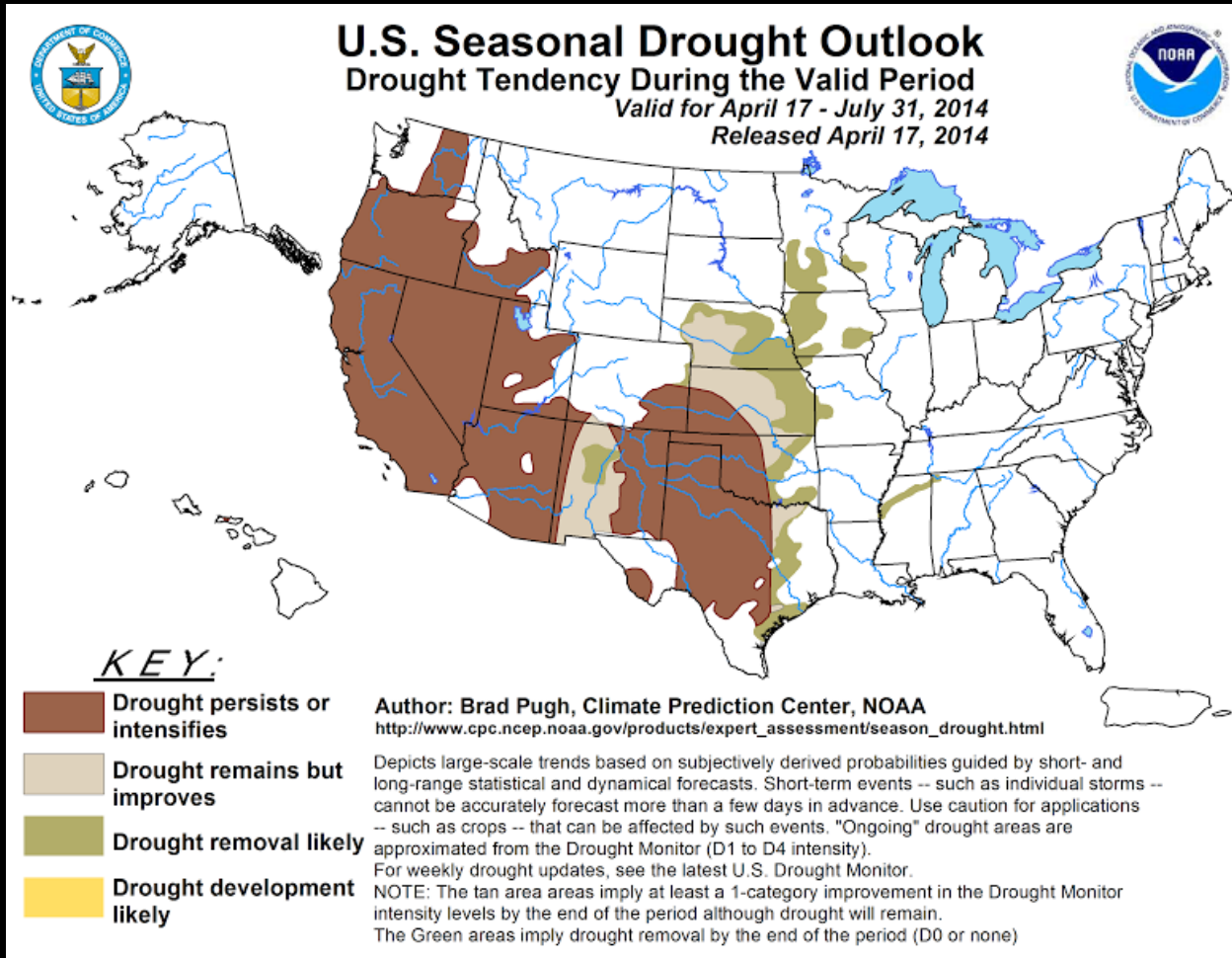


- Equal chances precipitation will be above, below, or near normal across Montana

# Drought Outlook through July

## Issued April 18

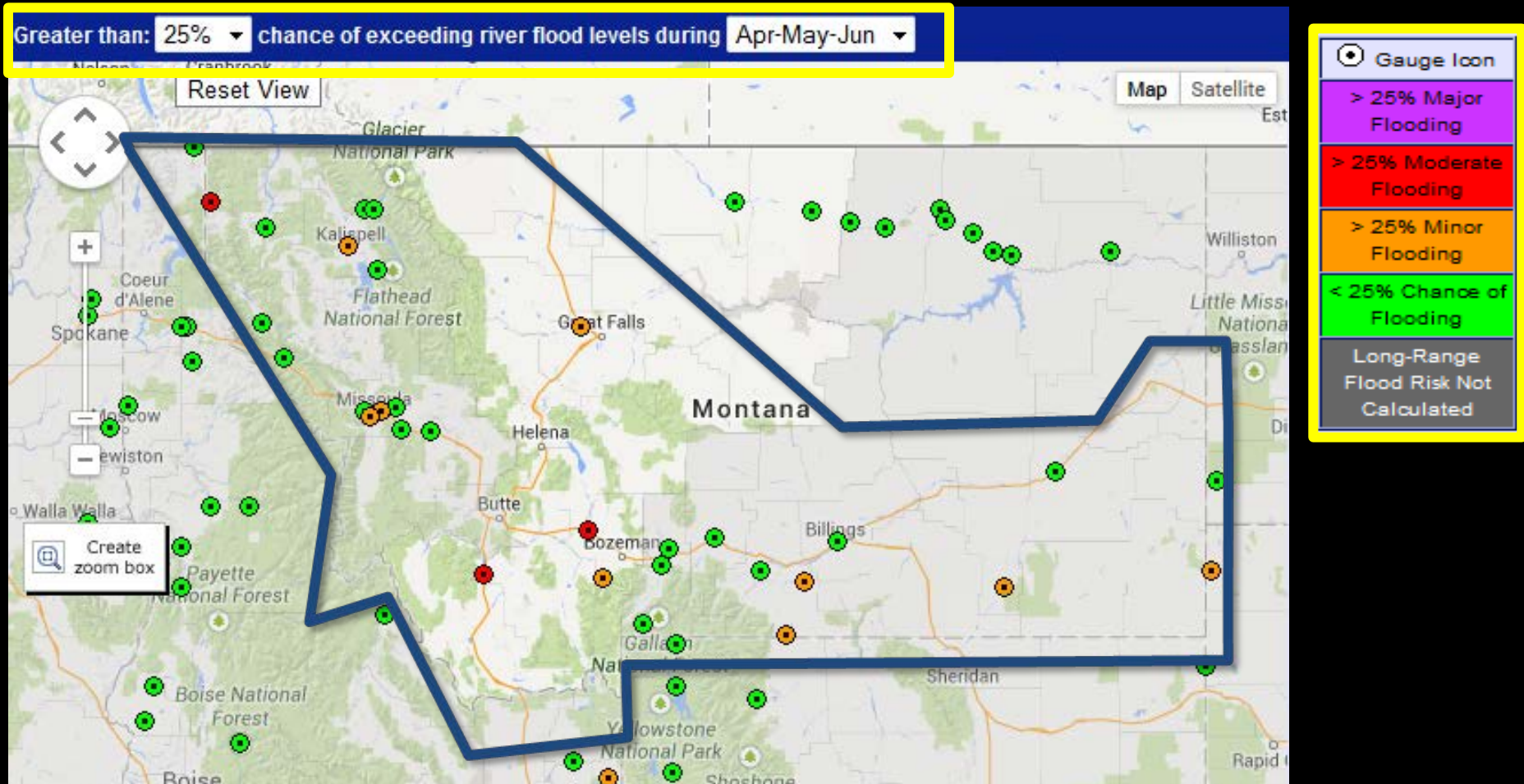
- Drought area just to southwest expected to persist/intensify



**NOAA - National Weather Service**

# Probability of Flooding

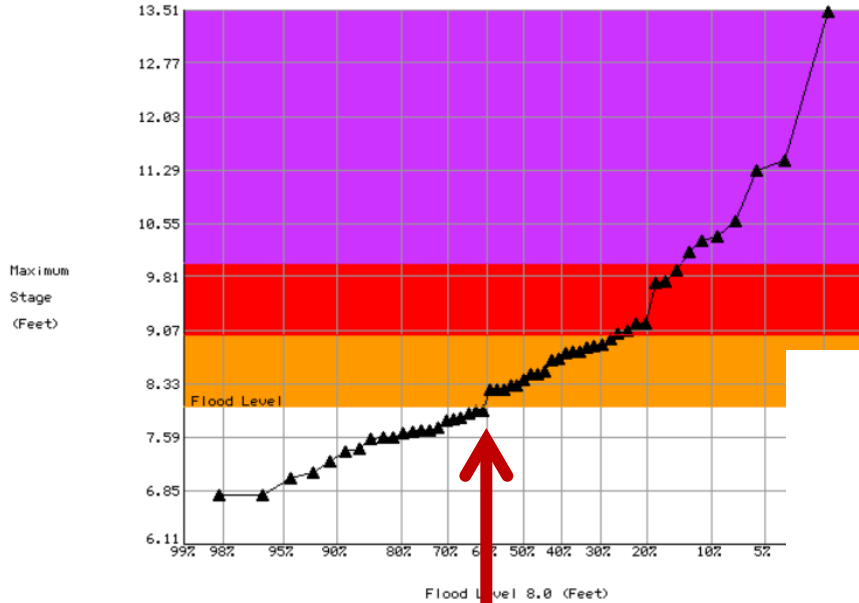
## April - June



**NOAA - National Weather Service**

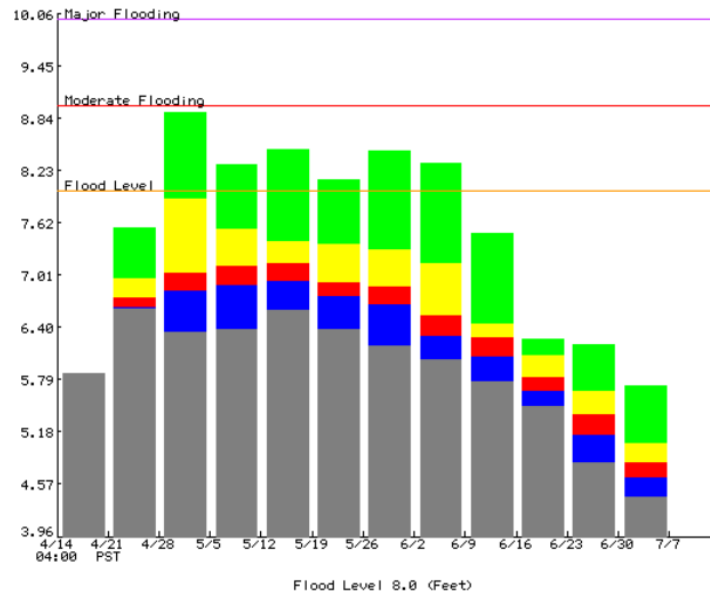
# Yaak River - Troy

Chances of Exceeding River Levels on the YAAK R NR TROY at YAAK R NR TROY  
Latitude: 48.6 Longitude: -116.0  
Forecast for the period 4/14/2014 - 7/12/2014  
This is a conditional simulation based on the current conditions as of 4/14/2014



Major Flooding  
Above 10.0 Feet.  
Moderate Flooding  
9.0-10.0 Feet.  
Minor Flooding  
8.0-9.0 Feet.

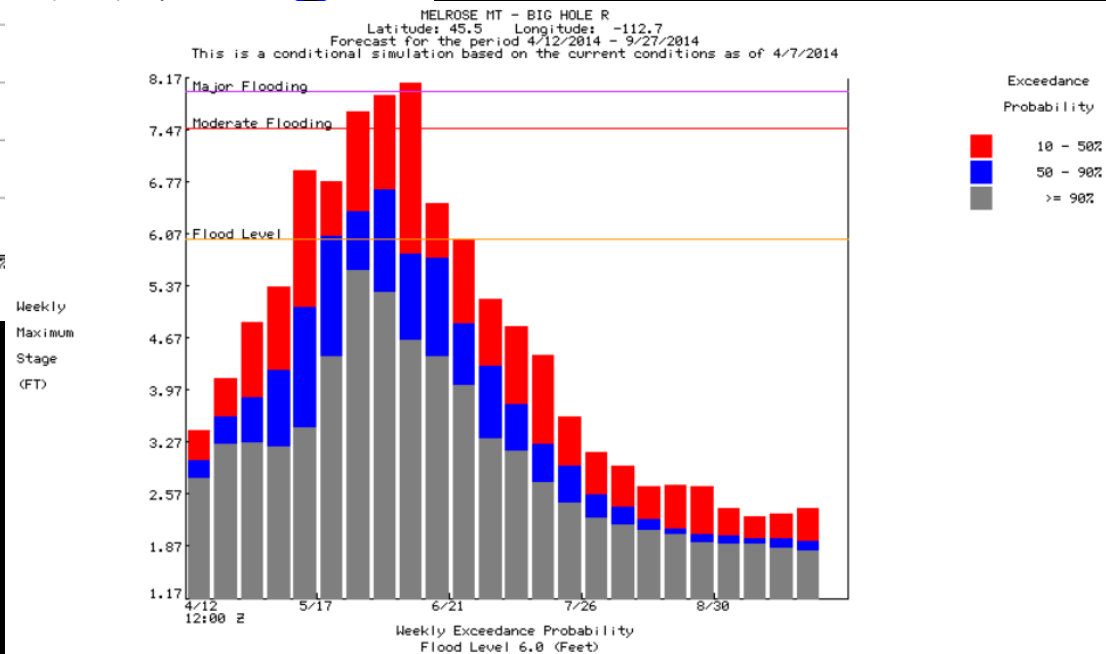
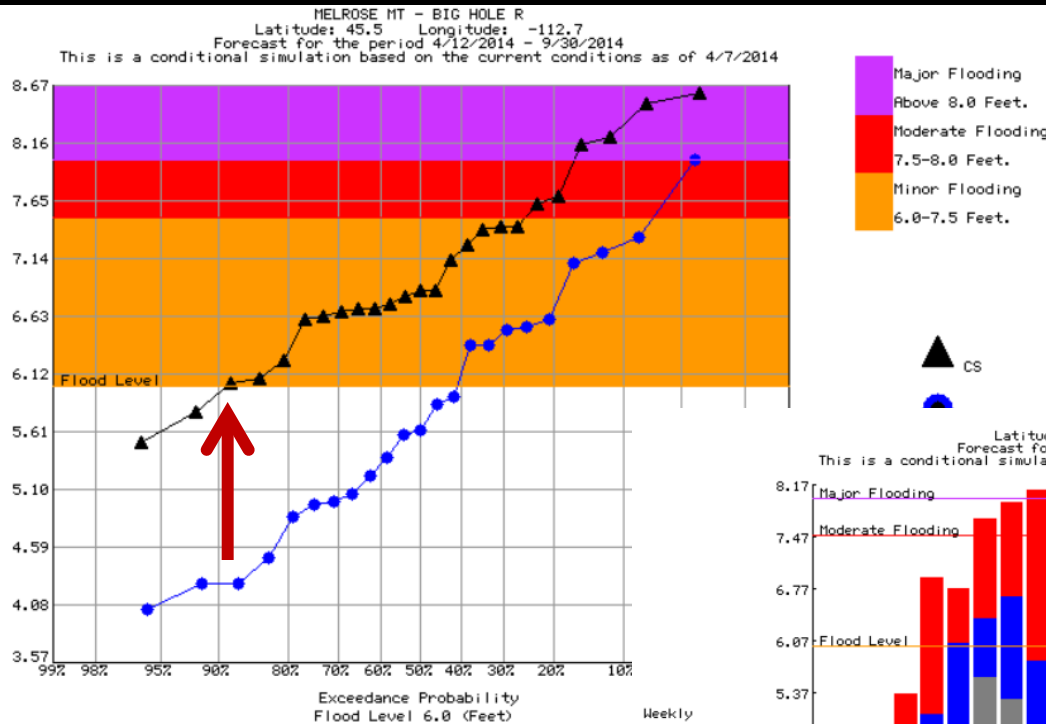
1 Week Chances of Exceeding River Levels on the YAAK R NR TROY at YAAK R NR TROY  
Latitude: 48.6 Longitude: -116.0  
Forecast for the period 4/14/2014 - 7/7/2014  
This is a conditional simulation based on the current conditions as of 4/14/2014



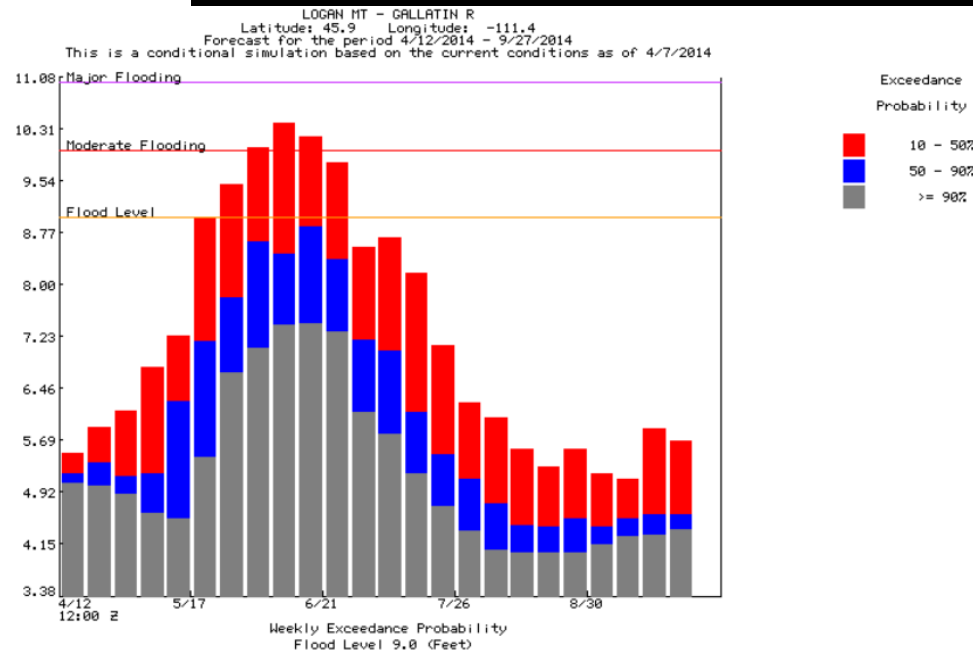
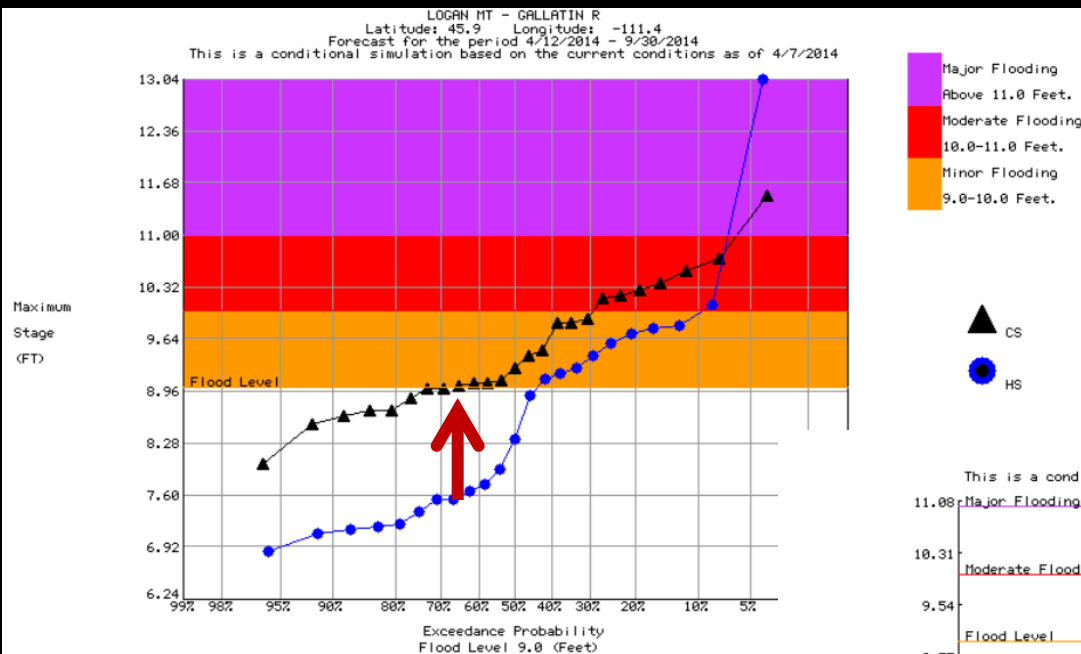
NOAA - National Weather Service



# Big Hole River - Melrose



# Gallatin River - Logan



NOAA - National Weather Service

# In Summary...

- First half of water year brought above to well above normal precipitation across much of Montana
- Snowmelt started and ahead of trend in 2011
- Expect minor flooding west, central and south
  - Particularly mountain-fed stream and small rivers
- Game changing event would rapidly increase chances of and severity of flooding
- No drought conditions noted on National Drought Monitor or Montana Drought Status Map
  - Small area of abnormally dry in far southwest



weather.gov

weather.gov/billings

weather.gov/glasgow

weather.gov/missoula

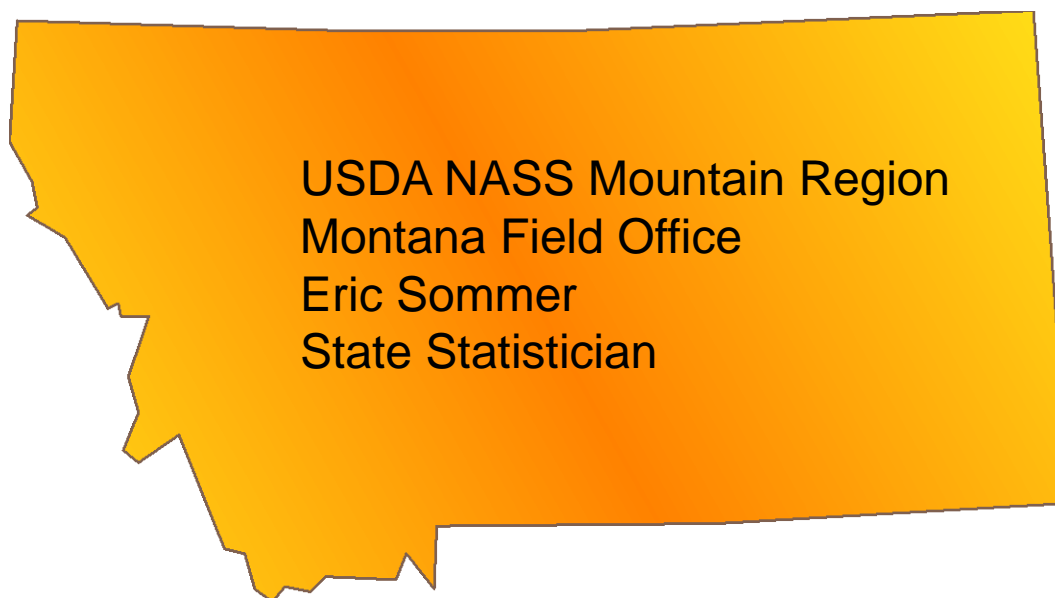
weather.gov/greatfalls



***NOAA - National Weather Service***



# Governor's Drought & Water Supply Advisory Committee



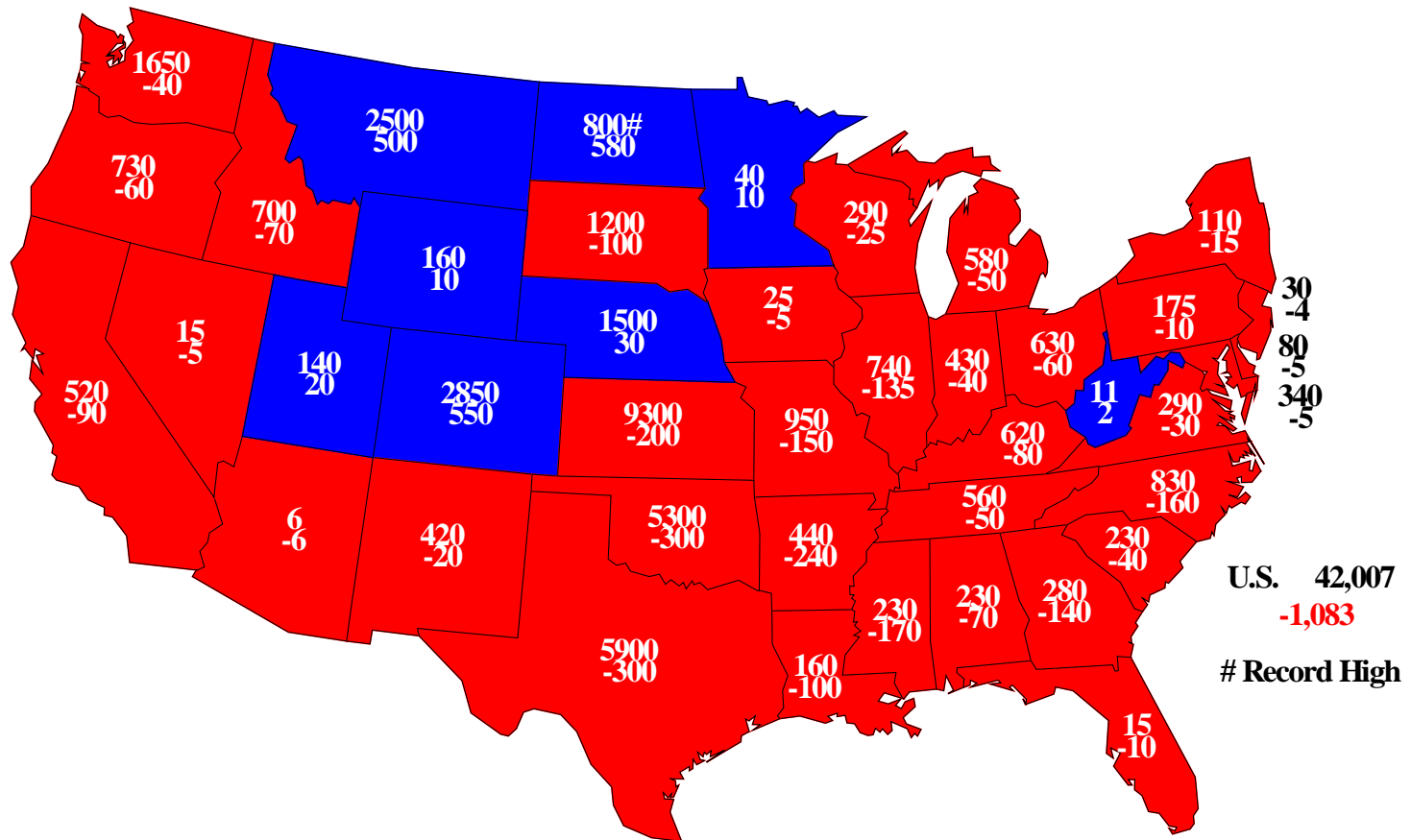
# March 2014 Montana Prospective Plantings

<b>Food Grains</b>	<b>2014 Intentions Thou. Acres</b>	<b>2013 Planted Thou. Acres</b>	<b>% Change</b>
<b>All Wheat</b>	<b>5,650</b>	<b>5,455</b>	<b>+ 3.6 %</b>
<b>Winter Wheat</b>	<b>2,500</b>	<b>2,000</b>	<b>+ 25 %</b>
<b>Durum</b>	<b>550</b>	<b>505</b>	<b>+ 8.9 %</b>
<b>Spring Wheat</b>	<b>2,600</b>	<b>2,950</b>	<b>- 11.9 %</b>



# Winter Wheat Planted, 2014

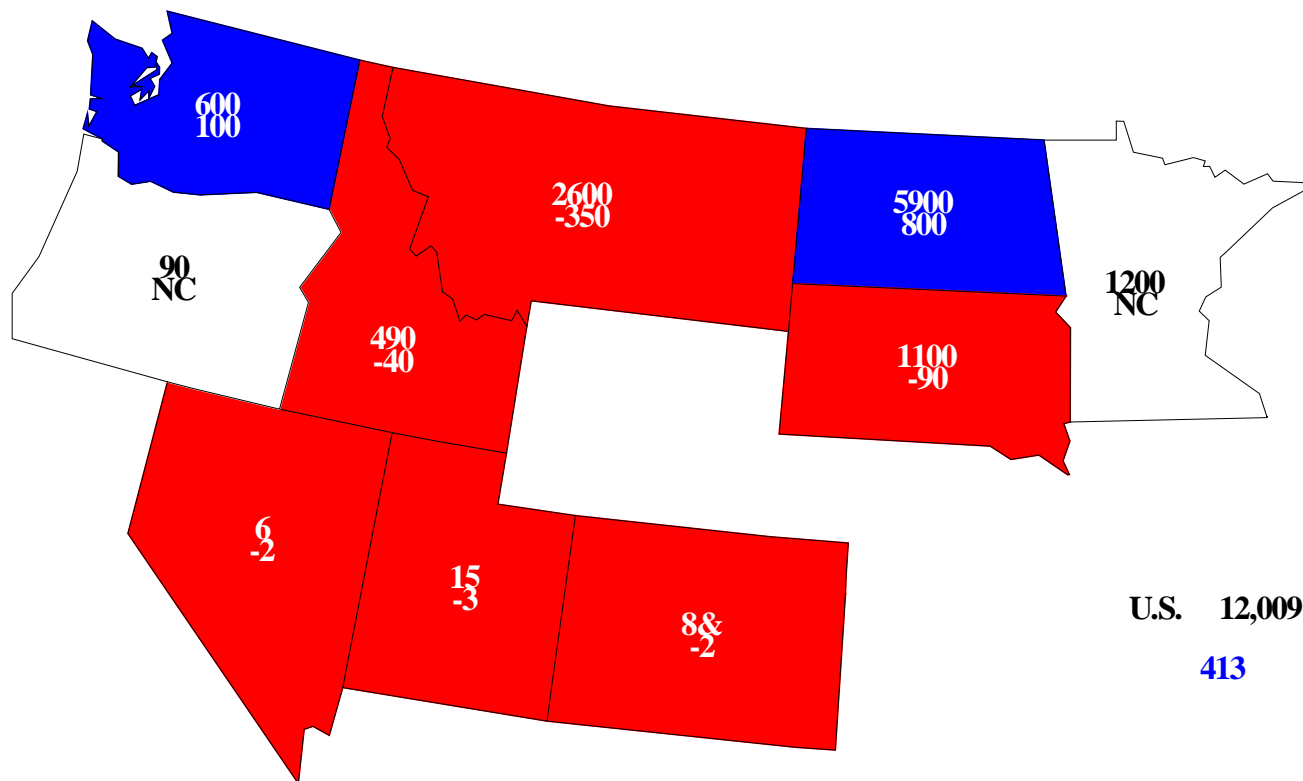
## Acres (000) and Change From Previous Year





# Other Spring Wheat Planted, 2014

## Acres (000) and Change From Previous Year



U.S. 12,009

413

& Record Low

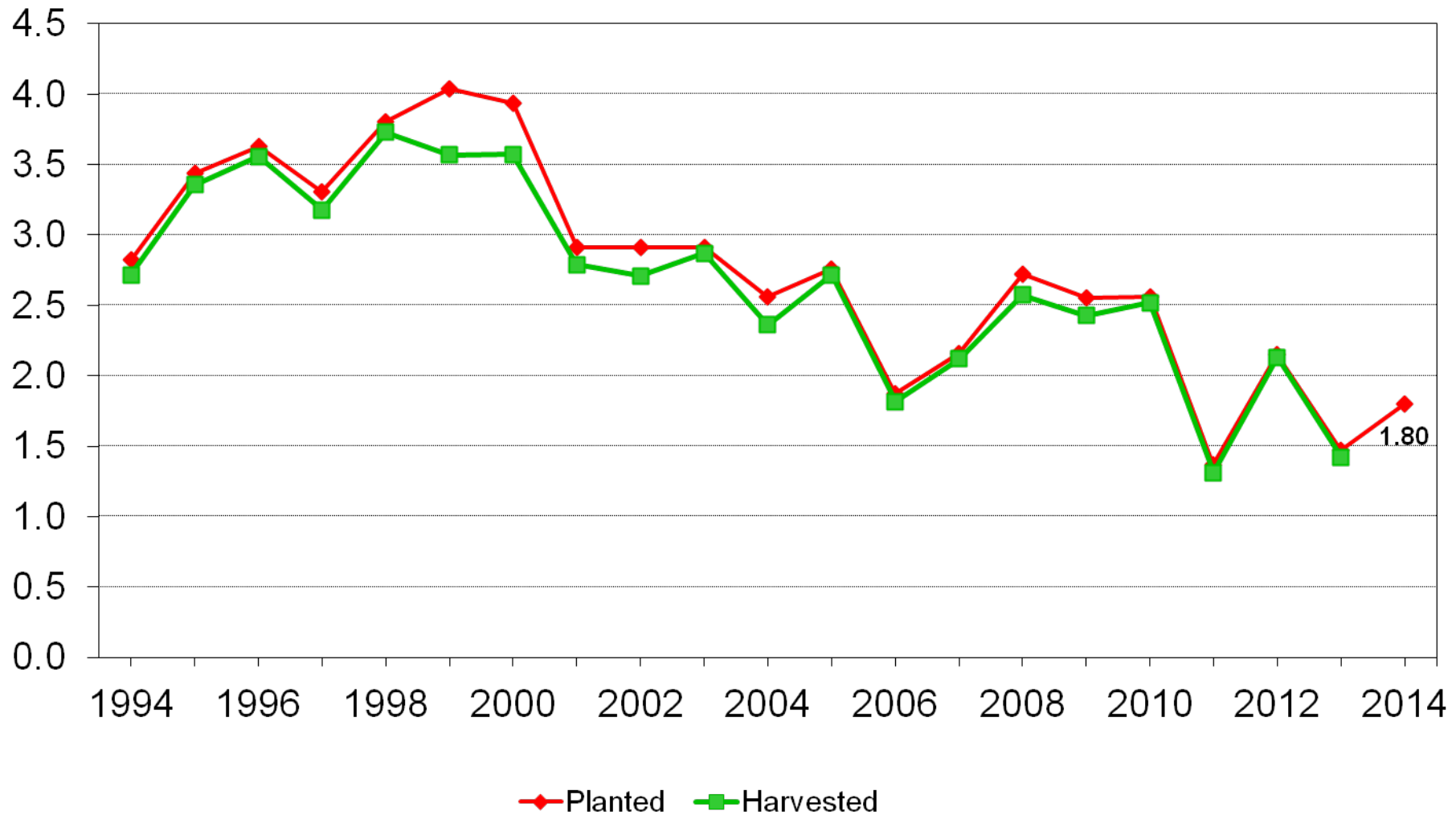
NC = No Change





# U.S. Durum Wheat Acres

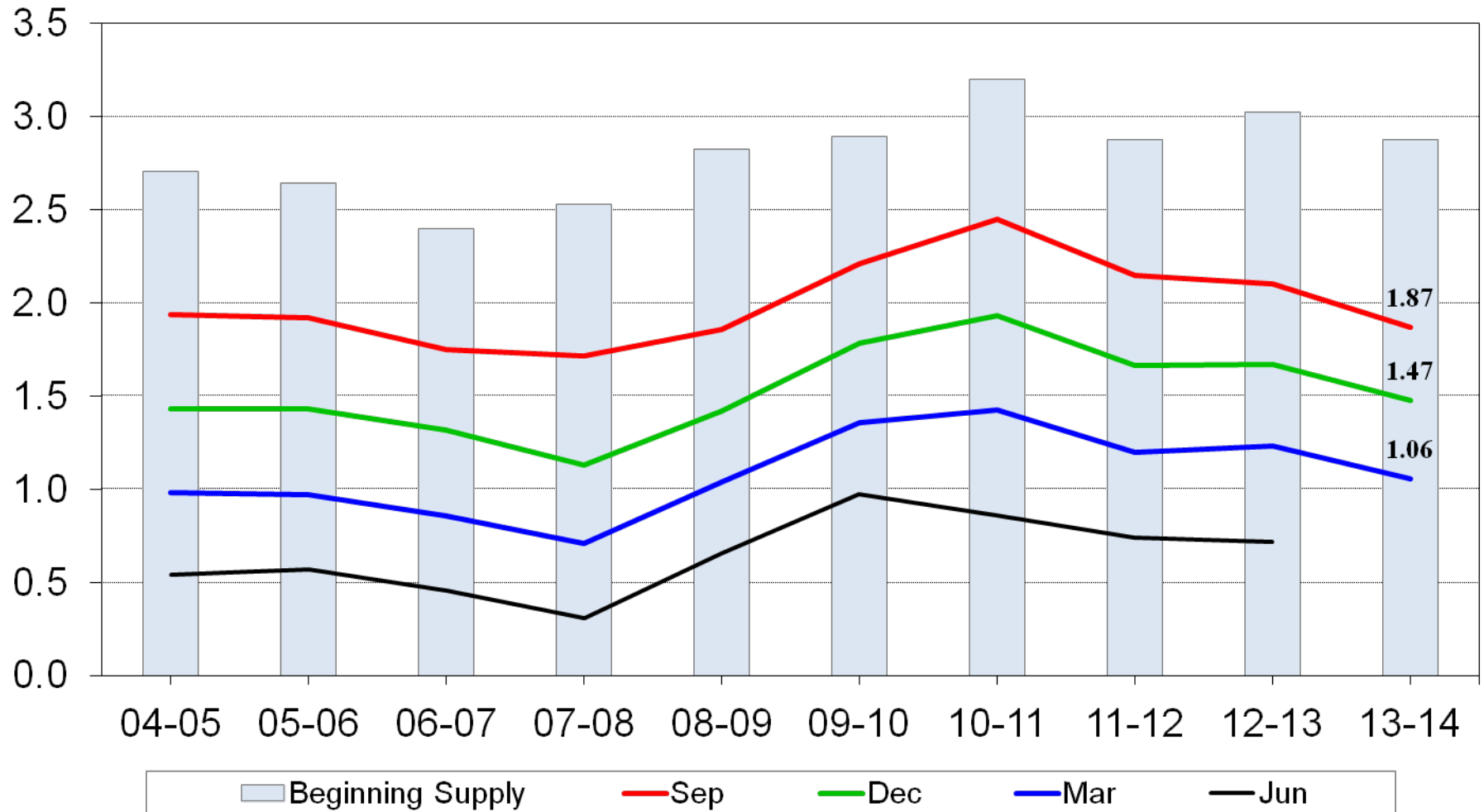
Million acres





# U.S. All Wheat Stocks

Billion bushels



# March 2014 Montana Prospective Plantings

<b>Feed Grains</b>	<b>2014 Intentions Thou. Acres</b>	<b>2013 Planted Thou. Acres</b>	<b>% Change</b>
<b>Corn</b>	<b>120</b>	<b>120</b>	<b>NC</b>
<b>Oats</b>	<b>50</b>	<b>50</b>	<b>NC</b>
<b>Barley</b>	<b>900</b>	<b>990</b>	<b>- 9.1 %</b>

# March 2014 Montana Prospective Plantings

<b>Other Crops</b>	<b>2014 Intentions Thou. Acres</b>	<b>2013 Planted Thou. Acres</b>	<b>% Change</b>
<b>All Hay (Harv)</b>	<b>2,700</b>	<b>2,800</b>	<b>- 3.6 %</b>
<b>All Dry Peas</b>	<b>520</b>	<b>440</b>	<b>+18.2 %</b>
<b>Austrian Winter Peas</b>	<b>20</b>	<b>10</b>	<b>+ 100 %</b>
<b>Lentils</b>	<b>120</b>	<b>140</b>	<b>- 14.3 %</b>



# March 2014 Montana Prospective Plantings

<b>Other Crops</b>	<b>2014 Intentions Thou. Acres</b>	<b>2013 Planted Thou. Acres</b>	<b>% Change</b>
<b>Sugar beets</b>	<b>45.1</b>	<b>43.4</b>	<b>+ 3.9 %</b>
<b>All Dry Beans</b>	<b>38</b>	<b>24</b>	<b>+ 58.3 %</b>
<b>Flaxseed</b>	<b>20</b>	<b>20</b>	<b>NC</b>
<b>Canola</b>	<b>67</b>	<b>72</b>	<b>- 6.9 %</b>

# **Crop Weather Report**

## **Week Ending April 13, 2014**

- Topsoil and subsoil moisture conditions were better than a year ago but comparable to the five year average.
- Seeding continue to lag behind last year and the five year averages, due to early spring/ winter weather conditions.

# Topsoil Moisture

## Week Ending April 13, 2014

	This week	Last week	Last year	5-yr avg.
Very short	2	2	12	7
Short	9	9	23	17
Adequate	73	68	62	63
Surplus	16	21	3	13

# Subsoil Moisture

## Week Ending April 13, 2014

	This week	Last week	Last year	5-yr avg.
Very short	3	4	23	10
Short	10	9	27	22
Adequate	76	75	49	61
Surplus	11	12	1	7



# Winter Wheat Condition

## Week Ending April 13, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	1	4	30	56	9
Last week	1	4	31	55	9
Last year	3	10	34	47	6
5-yr avg.	1	7	34	51	7

# Seeding Completed

## Week Ending April 13, 2014

	This week	Last week	Last year	5-yr avg.
Spring Wheat	3	NA	6	8
Barley	3	NA	19	16
Oats	NR		8	7
Dry Peas	NR		4	12
Lentils	NR		1	6
Flaxseed	NR		1	3
Canola	NR		13	2

# **Livestock Grazing**

## **Week Ending April 13, 2014**

- 45 percent of grazing land was open, below last year's 50 percent and the five-year average of 63 percent.
- 93 percent of cattle & calves and 93 percent of sheep & lambs were receiving supplemental feed

# Range & Pasture Feed Condition

## Week Ending April 13, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	3	24	43	28	2
Last week	4	21	43	29	3
Last year	25	35	32	8	0
5-yr avg.	9	19	44	26	2

## **Calving & Lambing Completed Week Ending April 13, 2014**

- 55 percent of cows have calved, behind last year's 69 percent and the five-year average of 70 percent.
- 38 percent of ewes have lambed, compared to 51 percent last year and 56 percent for the five-year average.



# **Summary**

## **Week ending April 13, 2014**

- Soil moisture conditions continue to be above average thanks to ample snowpack and continued precipitation
- 3.2 days were suitable for field work during the week, compared to 2.6 days last year and 3.3 days for the five-year average
- Early spring planting of most crops was well behind last year, due to snowfall and freezing temperatures

# May 1 Releases

- 2012 Census of Agriculture
  - County Level Data
  - Comprehensive breakouts
  - Released May 2 at 10 am MDT
- May Crop Production
  - Winter wheat yield and hay stocks May 1 forecast will be released on May 9

# **USDA, NASS, Montana Field Office**

Eric Sommer, State Statistician

1-800-835-2612 or 406-441-1240

Email: [nass-mt@nass.usda.gov](mailto:nass-mt@nass.usda.gov)

[www.nass.usda.gov/mt/](http://www.nass.usda.gov/mt/)

[http://www.nass.usda.gov/Statistics\\_by\\_State/Montana  
Publications/Crop\\_Progress\\_&\\_Condition/index.asp](http://www.nass.usda.gov/Statistics_by_State/Montana/Publications/Crop_Progress_&_Condition/index.asp)

# Montana Snow Survey



**Governor's  
Drought & Water  
Supply Advisory  
Committee**

**Snow Survey and  
Water Supply  
Report**

**April 17<sup>th</sup>, 2014**

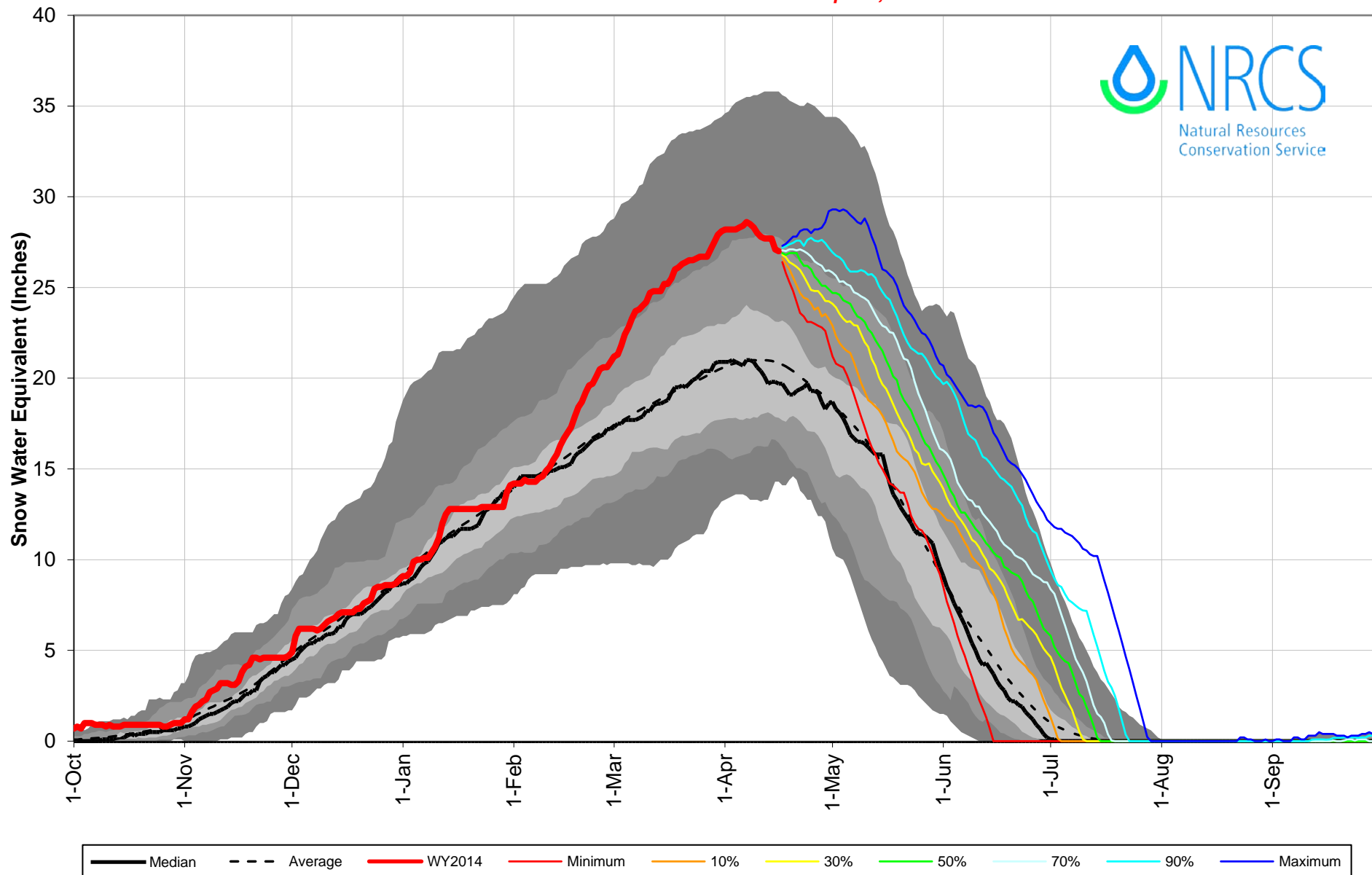


**Brian Domonkos  
Water Supply Specialist  
USDA NRCS Montana Snow Surveys**

**<http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/>**

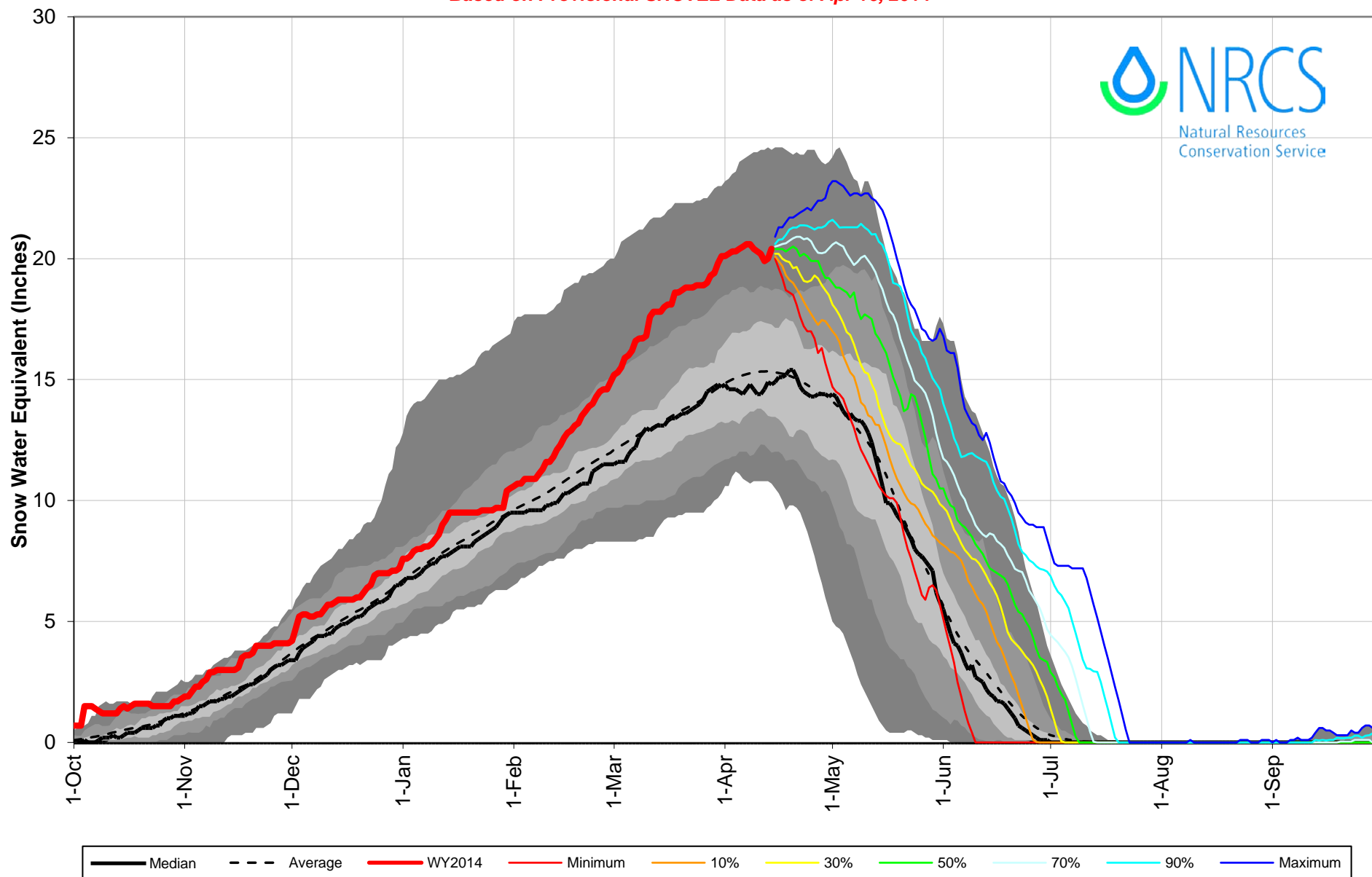
**Brian.Domonkos@mt.usda.gov  
406-587-6991**

**Based on Provisional SNOTEL Data as of Apr 16, 2014**





**Based on Provisional SNOTEL Data as of Apr 16, 2014**



# Montana Snow Survey

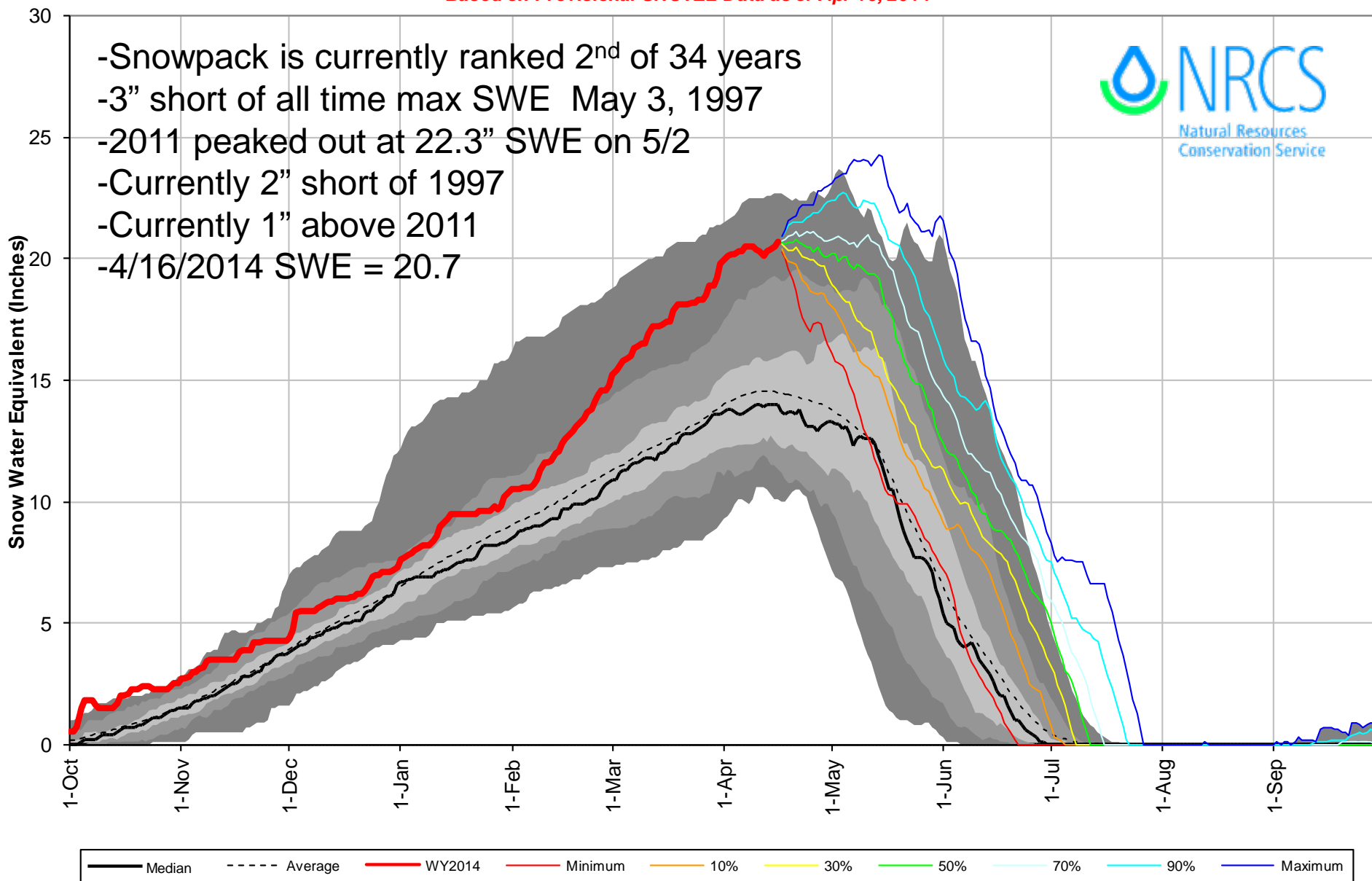


## Yellowstone River Basin Snowpack with Non-Exceedence Projections

*Based on Provisional SNOTEL Data as of Apr 16, 2014*



- Snowpack is currently ranked 2<sup>nd</sup> of 34 years
- 3" short of all time max SWE May 3, 1997
- 2011 peaked out at 22.3" SWE on 5/2
- Currently 2" short of 1997
- Currently 1" above 2011
- 4/16/2014 SWE = 20.7

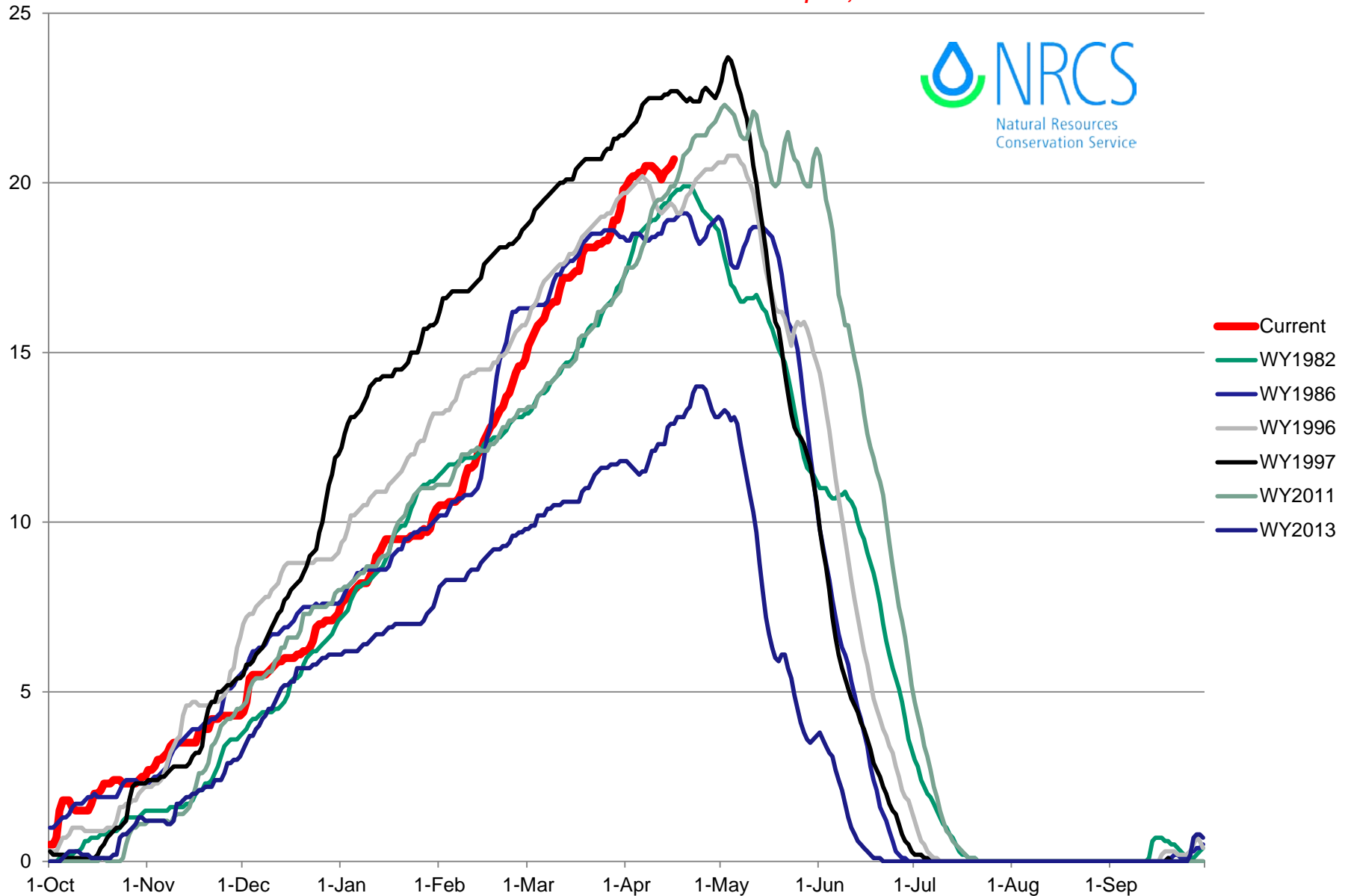


# Montana Snow Survey



## Yellowstone River Basin Snowpack with Select Analog Years

*Based on Provisional SNOTEL Data as of Apr 16, 2014*

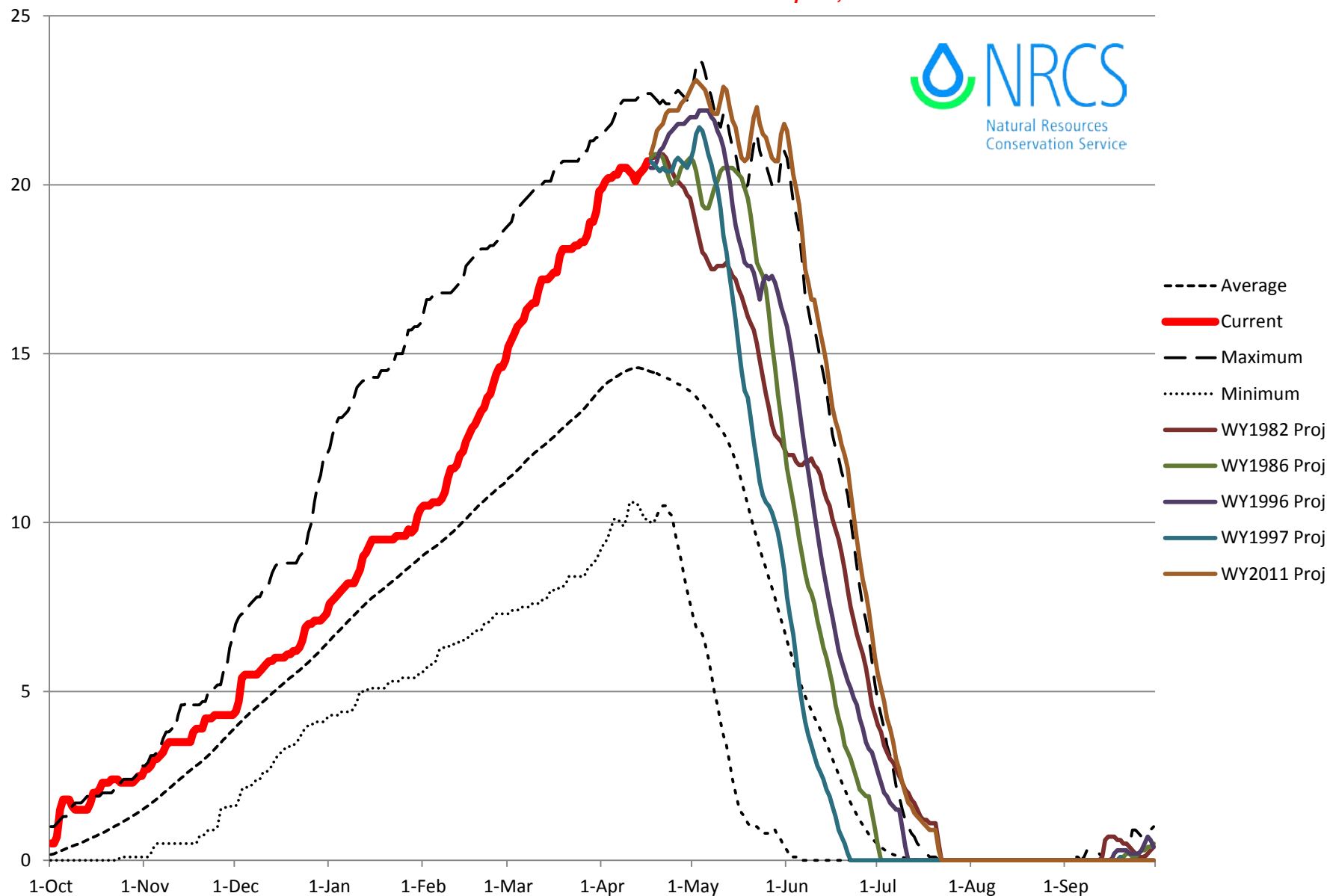


# Montana Snow Survey



## Yellowstone River Basin Snowpack with Select Analog Year Projections

*Based on Provisional SNOTEL Data as of Apr 16, 2014*



# Montana Snowpack Summary

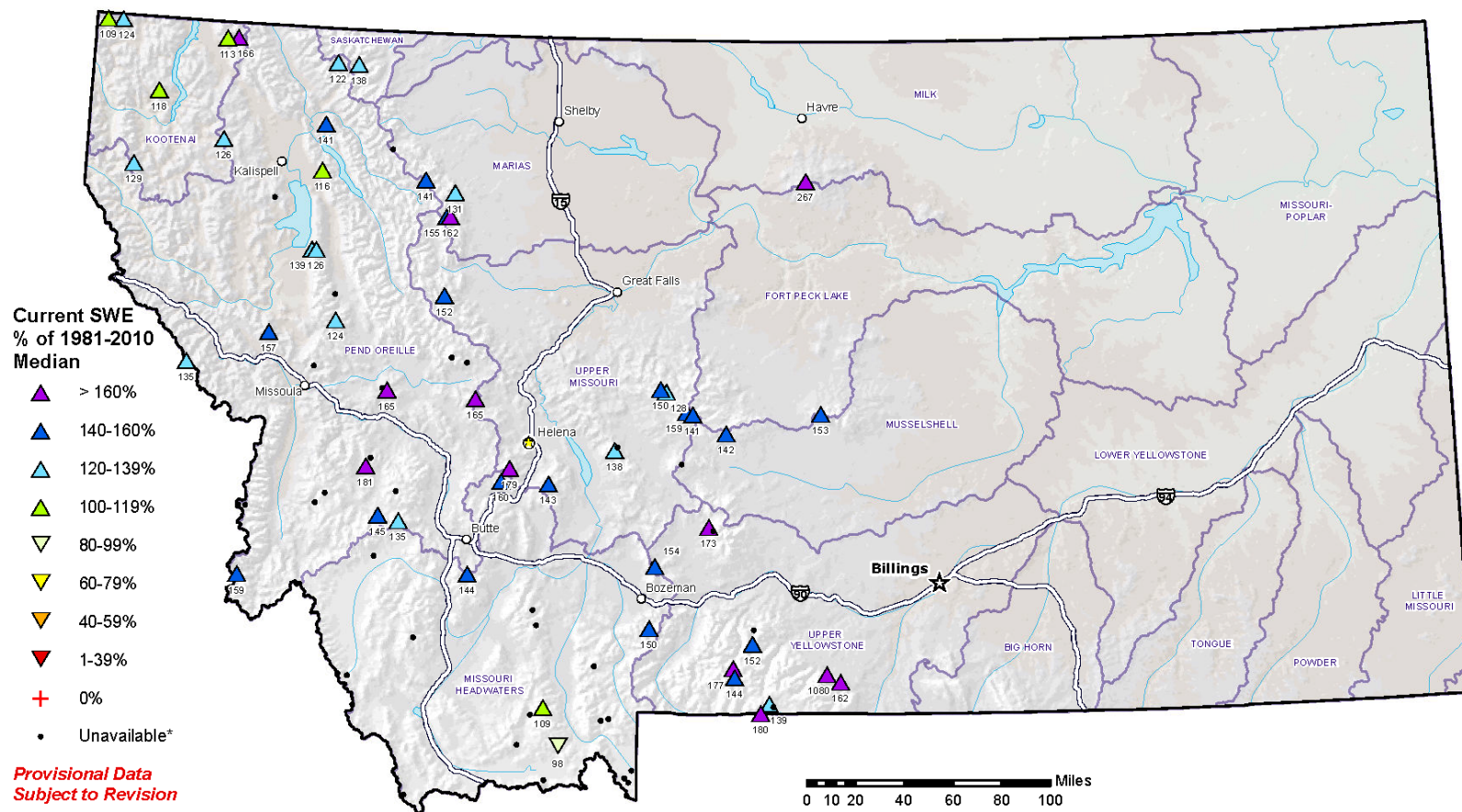
Showing Data For 4/14/2014	% Average	7 Day % Change	Last Year % Avg	Percent of Last Year	% of Avg Peak	Norm % Avg Peak	% of This Year's Peak
Columbia In Montana	130%	-5%	91%	143%	130%	100%	96%
East of Divide	135%	-4%	88%	154%	135%	100%	99%
Missouri Headwaters	126%	-5%	87%	144%	126%	100%	98%
Missouri River Basin	131%	-5%	88%	150%	131%	100%	98%
Yellowstone River Basin	140%	-3%	88%	160%	140%	100%	100%
St. Mary & Milk Basin	126%	-9%	109%	116%	122%	97%	91%
<b>Montana Watersheds</b>	<b>133%</b>	<b>-4%</b>	<b>89%</b>	<b>150%</b>	<b>133%</b>	<b>100%</b>	<b>98%</b>

- In general snowpack melt timing is right on target, snowpack at beginning to show early signs of melt
- East of the Divide
  - Manual observations on Monday Mar 31<sup>st</sup> indicated snowpack at 6900 ft near Bozeman was not isothermal (all one temperature, and ready to melt)
  - Since then snowpack has ripened at all elevations but we still believe that the mid and upper elevations need more warmth before we see the majority of runoff begins
- West of the Divide
  - Snowpack is further along in the ripening process where low elevations are in primed for melt and mid elevations are just beginning to melt and runoff
  - Upper elevation snowpacks are nearly primed for melt based on observations at 6400ft on April 15<sup>th</sup> & 16<sup>th</sup>
- Streamflow is showing indications of snowmelt mainly west of the continental divide



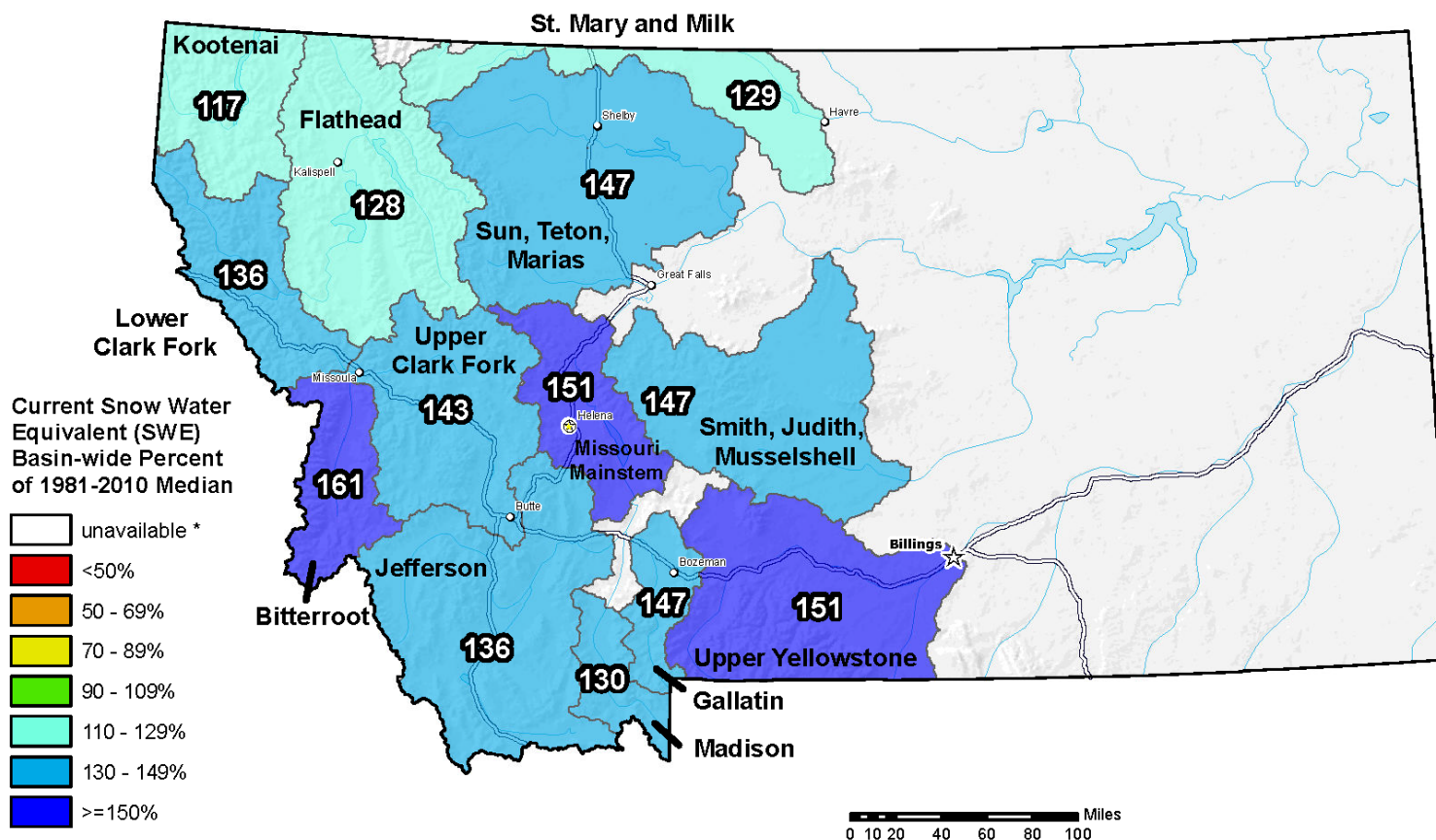
## Montana SNOTEL Snow Water Equivalent (SWE) % of Normal

Apr 14, 2014



## Montana SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 14, 2014



\* Data unavailable at time of posting or measurement is not representative at this time of year

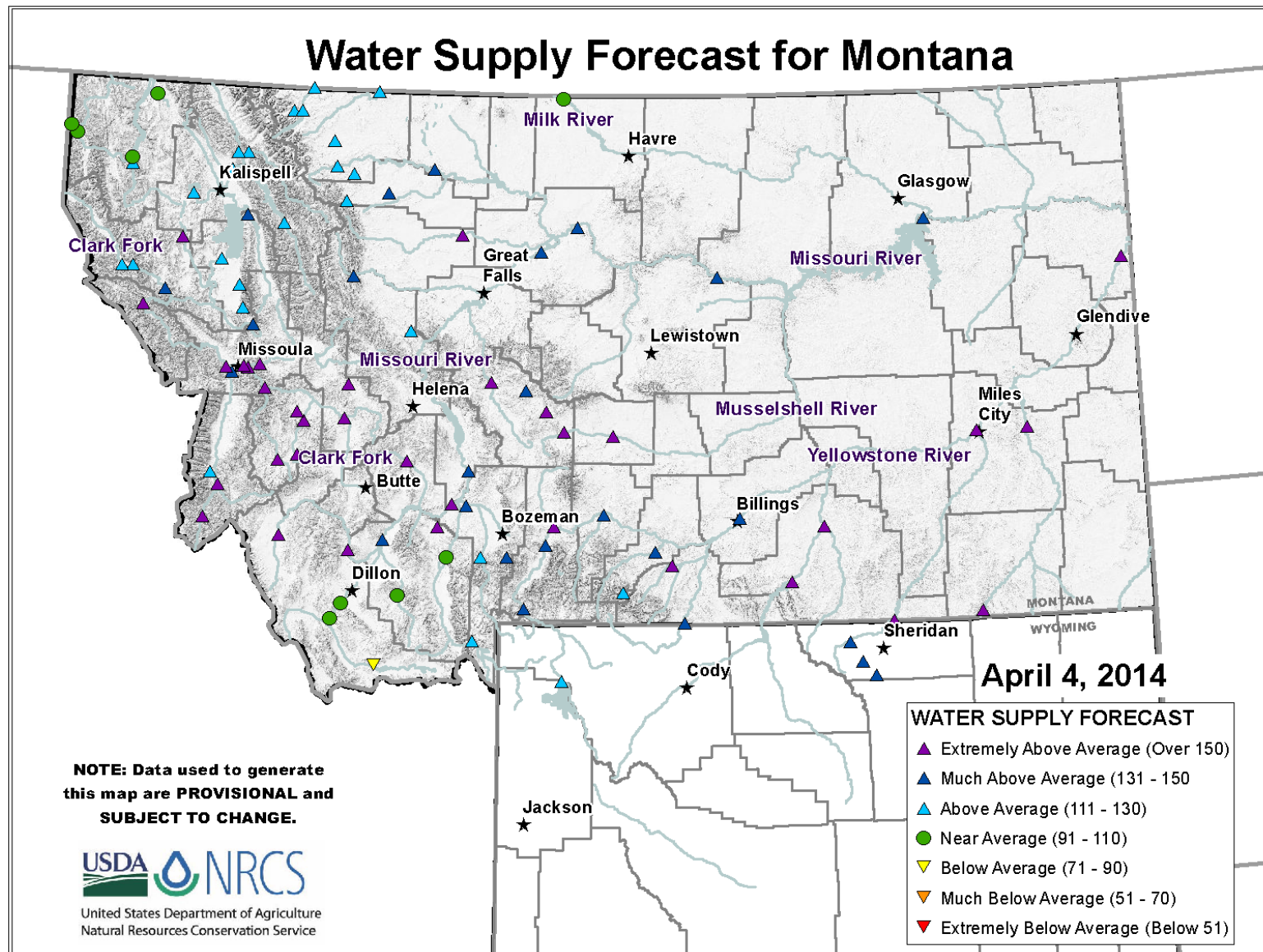
*Provisional Data  
Subject to Revision*



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:  
USDA/NRCS National Water and Climate Center  
Portland, Oregon  
<http://www.wcc.nrcs.usda.gov>

## Water Supply Forecast for Montana





# Volumetric Streamflow Forecasts

Generated April 1 in thousands of acre-feet

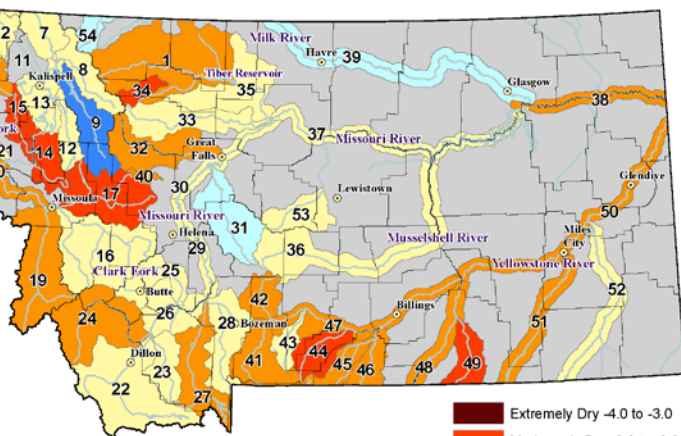
Basin	Apr-Jul 50% Forecast (KAF)	Average (KAF)	Last Year Obs Strmflow (KAF)	% of Avg	% of Last Year Strmflw
Columbia River Basin	78134	60505	53499.0	129%	131%
East Of Divide	71788	48607	29113.7	148%	201%
Missouri Headwaters Basins	5873	4376.8	2447.8	134%	239%
Missouri Mainstem Basins	35162	23754	11270.3	148%	196%
Missouri River Basin	41035	28131	13718.1	146%	203%
Yellowstone River Basin	30753	20476	15395.5	150%	199%
St. Mary & Milk River Basins	1097	983	1043.2	112%	102%
<b>STATE OF MONTANA</b>	<b>150928</b>	<b>110014</b>	<b>83592.6</b>	<b>137%</b>	<b>155%</b>

- Above numbers are the averages of all forecasts points in the particular basins
- One three forecasts are projected to be “below” average
  - Yaak R. nr Troy, MT – 99% average
  - Clark Canyon Res. Inflow – 97% average
  - Lima Reservoir Inflow - 80% average
- Majority of other forecasts predicted to be between 120 – 170% of normal with a few forecasts above 200% of normal
- April-May-June constitutes 30 percent of an average year’s mountain precipitation

# RIVER INDEX & SWSI VALUES

- 1 Marias above Tiber Reservoir -1.9
- 2 Tobacco -0.3
- 3 Kootenai Ft. Steele to Libby Dam 0.1
- 4 Kootenai below Libby Dam 1.5
- 5 Fisher -1.1
- 6 Yaak -1.2
- 7 North FK. Flathead 0.4
- 8 Middle FK. Flathead 0.6
- 9 South FK. Flathead 3.5
- 10 Flathead at Columbia Falls
- 11 Silverwater/Whitefish Rivers
- 12 Swan -0.6
- 13 Flathead at Polson 0.7
- 14 Mission Valley -2.8
- 15 Little Bitterroot -2.4
- 16 Clark Fork above Milltown -0.7
- 17 Blackfoot -2.2
- 18 Clark Fork above Missoula -0.7
- 19 Bitterroot -1.8
- 20 Clark Fork River below Bitterroot -2.1
- 21 Clark Fork River below Flathead 0.1
- 22 Beaverhead -0.3
- 23 Ruby -0.7
- 24 Big Hole -1.0
- 25 Boulder (Jefferson) -0.9
- 26 Jefferson -0.3
- 27 Madison -1.4
- 28 Gallatin -0.8
- 29 Missouri above Canyon Ferry 0.0
- 30 Missouri below Canyon Ferry 0.1
- 31 Smith 1.6
- 32 Sun -0.3
- 33 Teton 0.3
- 34 Birch/Dupuyer Creeks -2.5
- 35 Marias 0.1
- 36 Musselshell 0.1
- 37 Missouri above Fort Peck 0.6
- 38 Missouri below Fort Peck -1.5
- 39 Milk 1.9
- 40 Dearborn near Craig -1.1
- 41 Yellowstone above Livingston -1.2
- 42 Shields -1.8
- 43 Boulder (Yellowstone) -0.8
- 44 Stillwater -2.0
- 45 Rock/Red Lodge Creeks -1.3
- 46 Clark Fork Yellowstone -1.3
- 47 Yellowstone above Bighorn River -0.3
- 48 Bighorn below Bighorn Lake -1.0
- 49 Little Bighorn -2.2
- 50 Yellowstone below Bighorn -1.2
- 51 Tongue -1.2
- 52 Powder -0.3
- 53 Upper Judith 0.2
- 54 Saint Mary 1.2

## Surface Water Supply Index (SWSI) Values



March 7, 2013

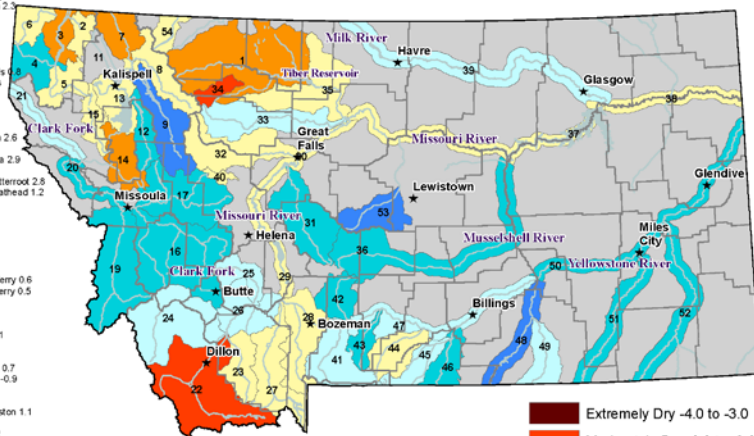
NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Slightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable

# RIVER INDEX & SWSI VALUES

- 1 Marias above Tiber Reservoir -1.2
- 2 Tobacco -0.8
- 3 Kootenai Ft. Steele to Libby Dam -1
- 4 Kootenai below Libby Dam 2.3
- 5 Fisher 0.2
- 6 Yaak -0.6
- 7 North FK. Flathead -1.2
- 8 Middle FK. Flathead 0.3
- 9 South FK. Flathead 3.1
- 10 Flathead at Columbia Falls
- 11 Silverwater/Whitefish Rivers
- 12 Swan 2.3
- 13 Flathead at Polson 0.3
- 14 Mission Valley -1
- 15 Little Bitterroot 0.6
- 16 Clark Fork above Milltown 2.6
- 17 Blackfoot 2.4
- 18 Clark Fork above Missoula 2.9
- 19 Bitterroot 2.4
- 20 Clark Fork River below Bitterroot 2.5
- 21 Clark Fork River below Flathead 1.2
- 22 Beaverhead -2.1
- 23 Ruby -0.7
- 24 Big Hole 1.5
- 25 Boulder (Jefferson) 1.8
- 26 Jefferson 1.9
- 27 Madison 0.9
- 28 Gallatin 0.7
- 29 Missouri above Canyon Ferry 0.6
- 30 Missouri below Canyon Ferry 0.5
- 31 Smith 2.3
- 32 Sun 0.4
- 33 Teton 1.1
- 34 Birch/Dupuyer Creeks -2.1
- 35 Marias 0.6
- 36 Musselshell 2.3
- 37 Missouri above Fort Peck 0.7
- 38 Missouri below Fort Peck -0.9
- 39 Milk 1.4
- 40 Dearborn near Craig 0.1
- 41 Yellowstone above Livingston 1.1
- 42 Shields 2.4
- 43 Boulder (Yellowstone) 2.2
- 44 Stillwater 0.6
- 45 Rock/Red Lodge Creeks 1.4
- 46 Clark Fork Yellowstone 2.3
- 47 Yellowstone above Bighorn River 1.2
- 48 Bighorn below Bighorn Lake 3.2
- 49 Little Bighorn 1.5
- 50 Yellowstone below Bighorn 2
- 51 Tongue 2.5
- 52 Powder 2.4
- 53 Upper Judith 3.4
- 54 Saint Mary 0.1

## Surface Water Supply Index (SWSI) Values



March 7, 2014

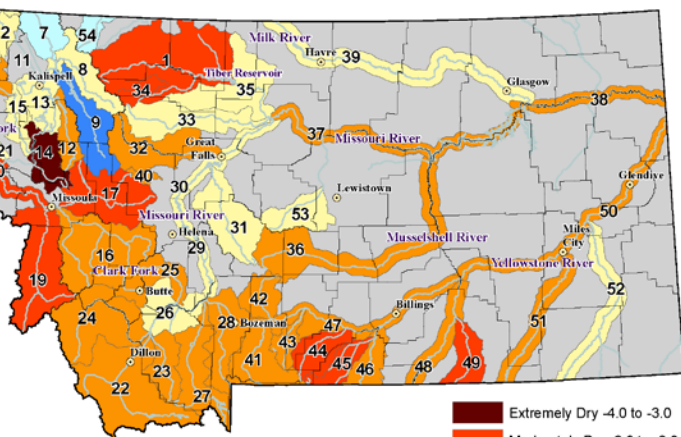
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- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Slightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable

# RIVER INDEX & SWSI VALUES

- 1 Marias above Tiber Reservoir -2.1
- 2 Tobacco 0.2
- 3 Kootenai Ft. Steele to Libby Dam 0.3
- 4 Kootenai below Libby Dam 2
- 5 Fisher -1.6
- 6 Yaak 0.8
- 7 North FK. Flathead 1.1
- 8 Middle FK. Flathead 0.7
- 9 South FK. Flathead 4
- 10 Flathead at Columbia Falls -1.6
- 11 Silverwater/Whitefish Rivers
- 12 Swan -1.4
- 13 Flathead at Polson 0.7
- 14 Mission Valley -3.3
- 15 Little Bitterroot -0.2
- 16 Clark Fork above Milltown -1.3
- 17 Blackfoot -2.4
- 18 Clark Fork above Missoula -2.3
- 19 Bitterroot -2
- 20 Clark Fork River below Bitterroot -2.1
- 21 Clark Fork River below Flathead -0.3
- 22 Beaverhead -1
- 23 Ruby -1.8
- 24 Big Hole -1.5
- 25 Boulder (Jefferson) -1.8
- 26 Jefferson -0.7
- 27 Madison -1.5
- 28 Gallatin -1.2
- 29 Missouri above Canyon Ferry -0.7
- 30 Missouri below Canyon Ferry -0.6
- 31 Smith 0.5
- 32 Sun -1.8
- 33 Teton 0.3
- 34 Birch/Dupuyer Creeks -2.4
- 35 Marias -0.2
- 36 Musselshell -1.2
- 37 Missouri above Fort Peck -1.2
- 38 Missouri below Fort Peck -1.7
- 39 Milk -0.7
- 40 Dearborn near Craig -1.5
- 41 Yellowstone above Livingston -1.8
- 42 Shields -1.8
- 43 Boulder (Yellowstone) -1.1
- 44 Stillwater -2.1
- 45 Rock/Red Lodge Creeks -2.8
- 46 Clark Fork Yellowstone -1.6
- 47 Yellowstone above Bighorn River -1.8
- 48 Bighorn below Bighorn Lake -1.2
- 49 Little Bighorn -2.8
- 50 Yellowstone below Bighorn -1.5
- 51 Tongue -1.8
- 52 Powder -0.6
- 53 Upper Judith -0.7
- 54 Saint Mary 1.7

## Surface Water Supply Index (SWSI) Values



April 5, 2013

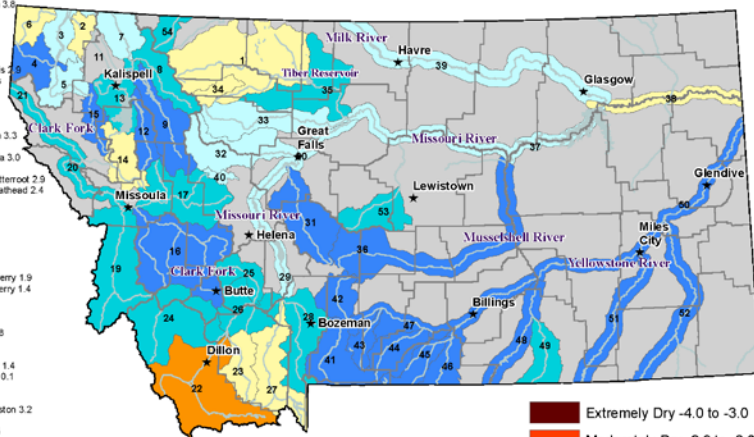
NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Slightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable

# RIVER INDEX & SWSI VALUES

- 1 Marias above Tiber Reservoir 0.6
- 2 Tobacco 0.4
- 3 Kootenai Ft. Steele to Libby Dam 1.0
- 4 Kootenai below Libby Dam 3.0
- 5 Fisher 1.6
- 6 Yaak 0.8
- 7 North FK. Flathead 1.7
- 8 Middle FK. Flathead 2.0
- 9 South FK. Flathead 4.0
- 10 Flathead at Columbia Falls
- 11 Silverwater/Whitefish Rivers
- 12 Swan 3.3
- 13 Flathead at Polson 2.1
- 14 Mission Valley 0.2
- 15 Little Bitterroot 3.2
- 16 Clark Fork above Milltown 3.3
- 17 Blackfoot 2.6
- 18 Clark Fork above Missoula 3.0
- 19 Bitterroot 2.6
- 20 Clark Fork River below Bitterroot 2.9
- 21 Clark Fork River below Flathead 2.4
- 22 Beaverhead -1.0
- 23 Ruby 0
- 24 Big Hole 2.6
- 25 Boulder (Jefferson) 2.9
- 26 Jefferson 2.2
- 27 Madison 0.3
- 28 Gallatin 2.1
- 29 Missouri above Canyon Ferry 1.9
- 30 Missouri below Canyon Ferry 1.4
- 31 Smith 3.0
- 32 Sun 1.6
- 33 Teton 1.9
- 34 Birch/Dupuyer Creeks -0.8
- 35 Marias 2.3
- 36 Musselshell 3.0
- 37 Missouri above Fort Peck 1.4
- 38 Missouri below Fort Peck 0.1
- 39 Milk 1.2
- 40 Dearborn near Craig 1.7
- 41 Yellowstone above Livingston 3.2
- 42 Shields 3.3
- 43 Boulder (Yellowstone) 3.5
- 44 Stillwater 3.0
- 45 Rock/Red Lodge Creeks 3.2
- 46 Clark Fork Yellowstone 3.3
- 47 Yellowstone above Bighorn River 3.2
- 48 Bighorn below Bighorn Lake 3.6
- 49 Little Bighorn 2.1
- 50 Yellowstone below Bighorn 3.5
- 51 Tongue 3.0
- 52 Powder 3.3
- 53 Upper Judith 2.4
- 54 Saint Mary 2.0

## Surface Water Supply Index (SWSI) Values



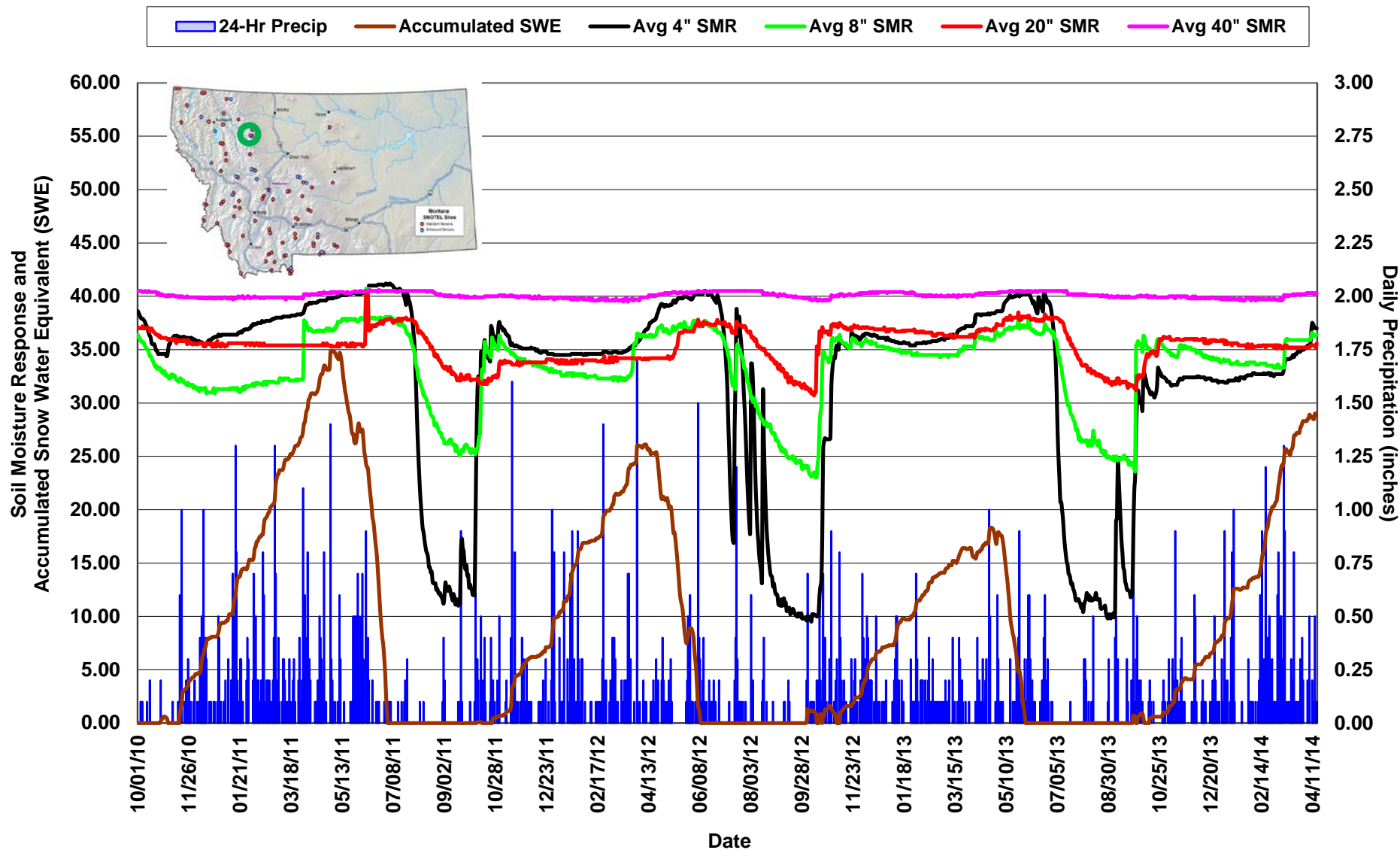
April 4, 2014

NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Slightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable



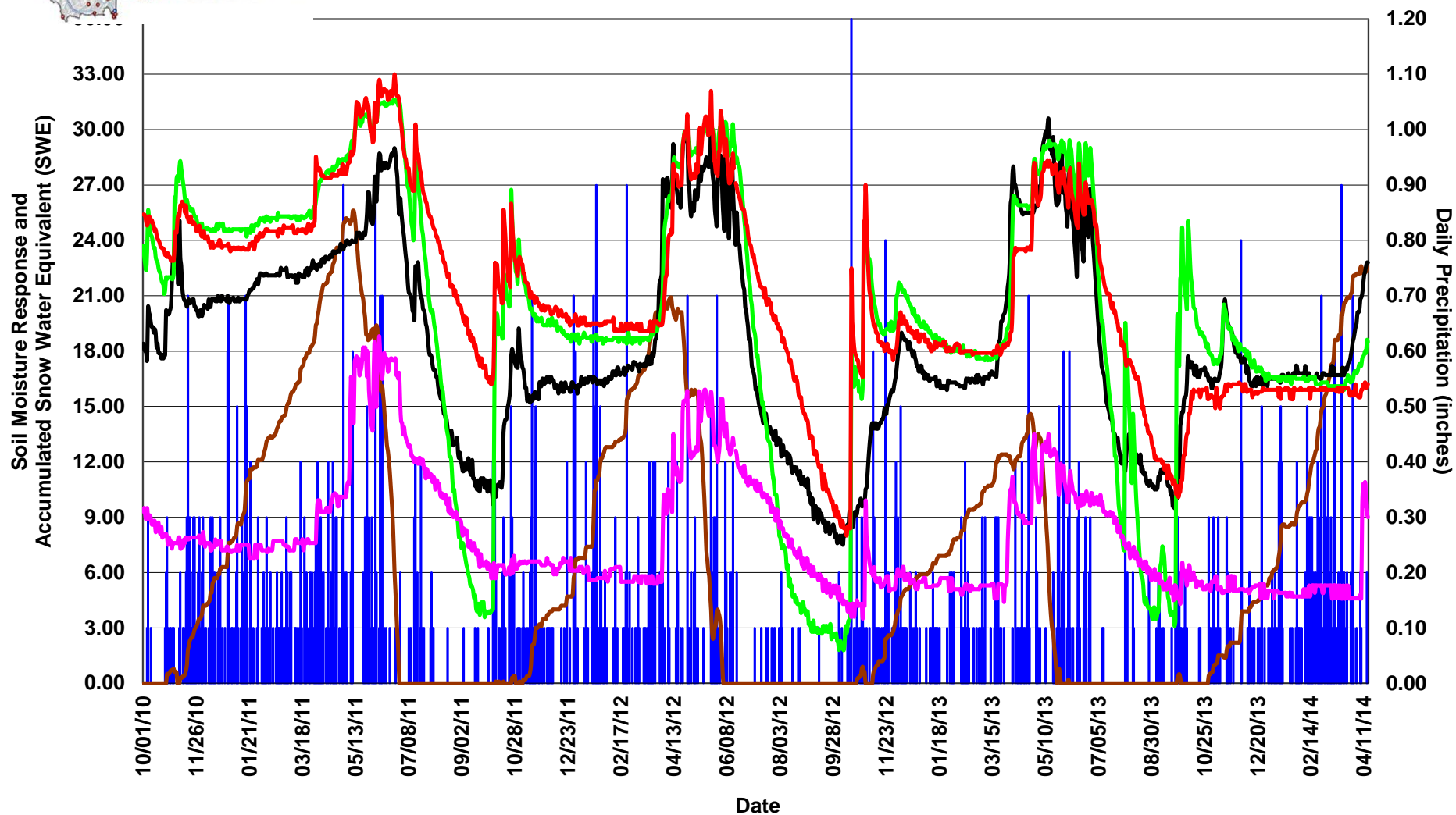
## Mt. Lockhart SNOTEL Water Year 2011-14 Soil Moisture Response Data



# Montana Snow Survey

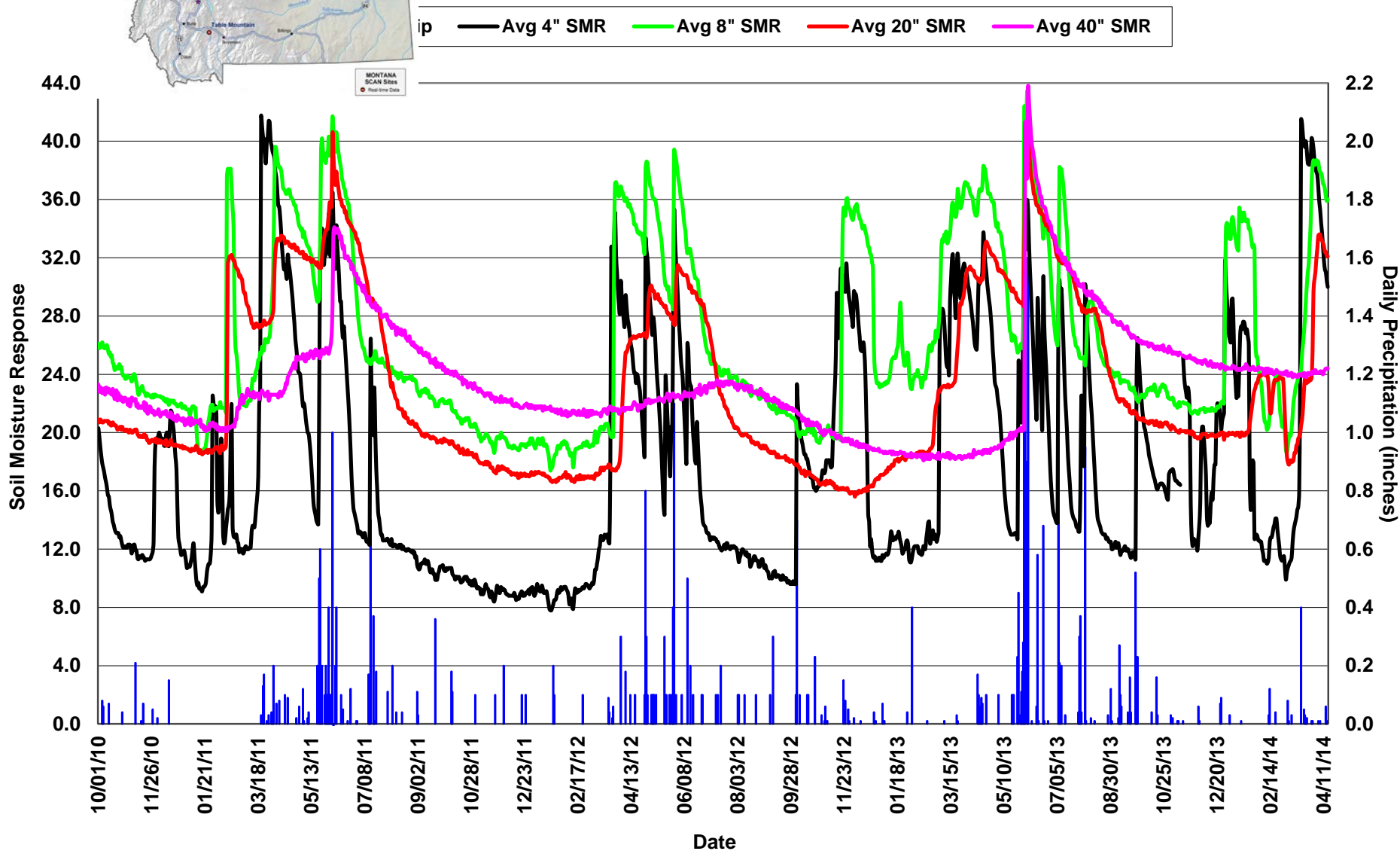


Nevada Ridge SNOTEL Water Year 2011-14  
Soil Moisture Response Data

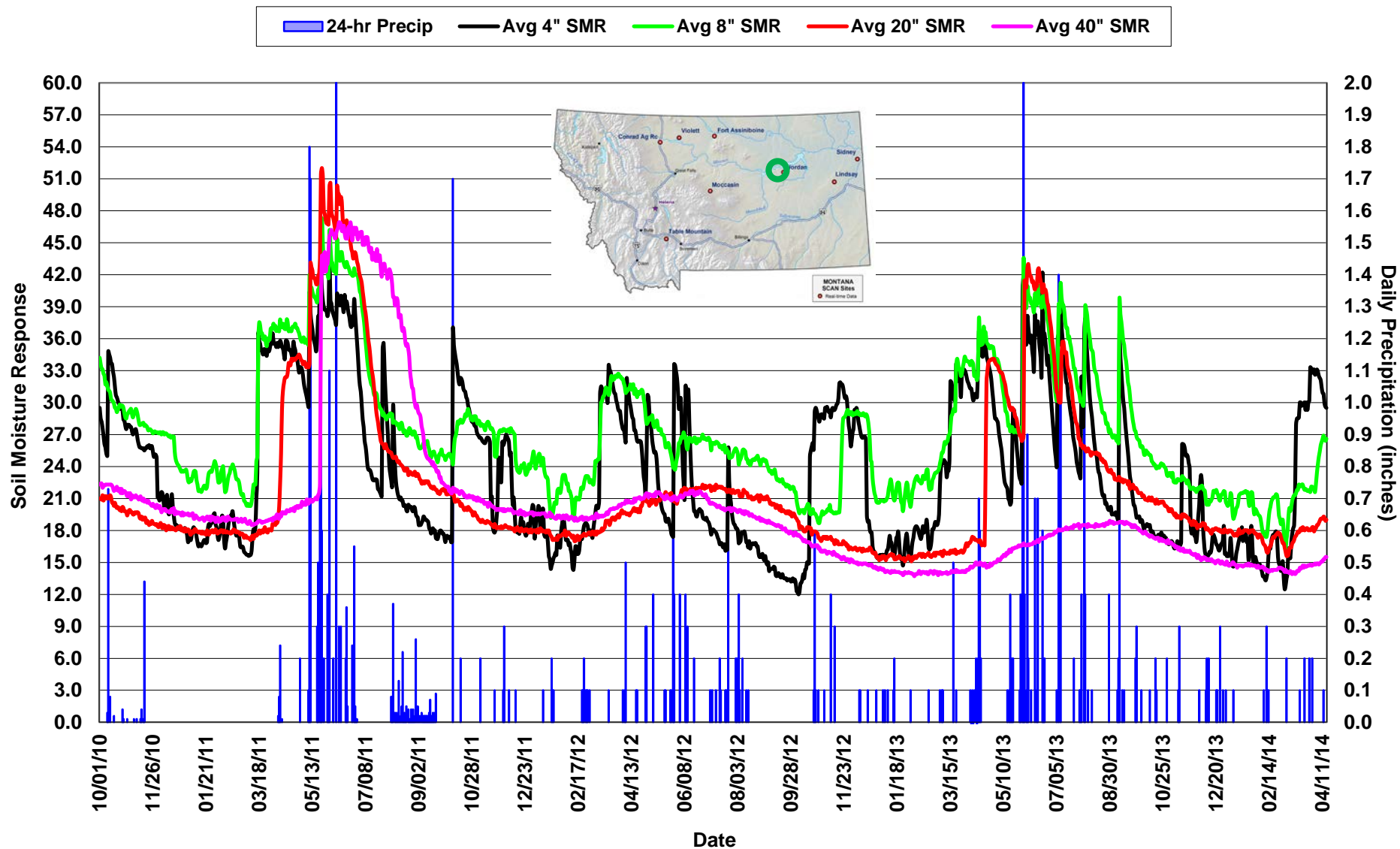




Ft. Assiniboine SCAN Water Year 2011-14  
Soil Moisture Response Data



## Jordan SCAN Water Year 2011-14 Soil Moisture Response Data



# Montana Snow Survey



Black Bear SNOTEL Water Year 2011-14  
Soil Moisture Response Data

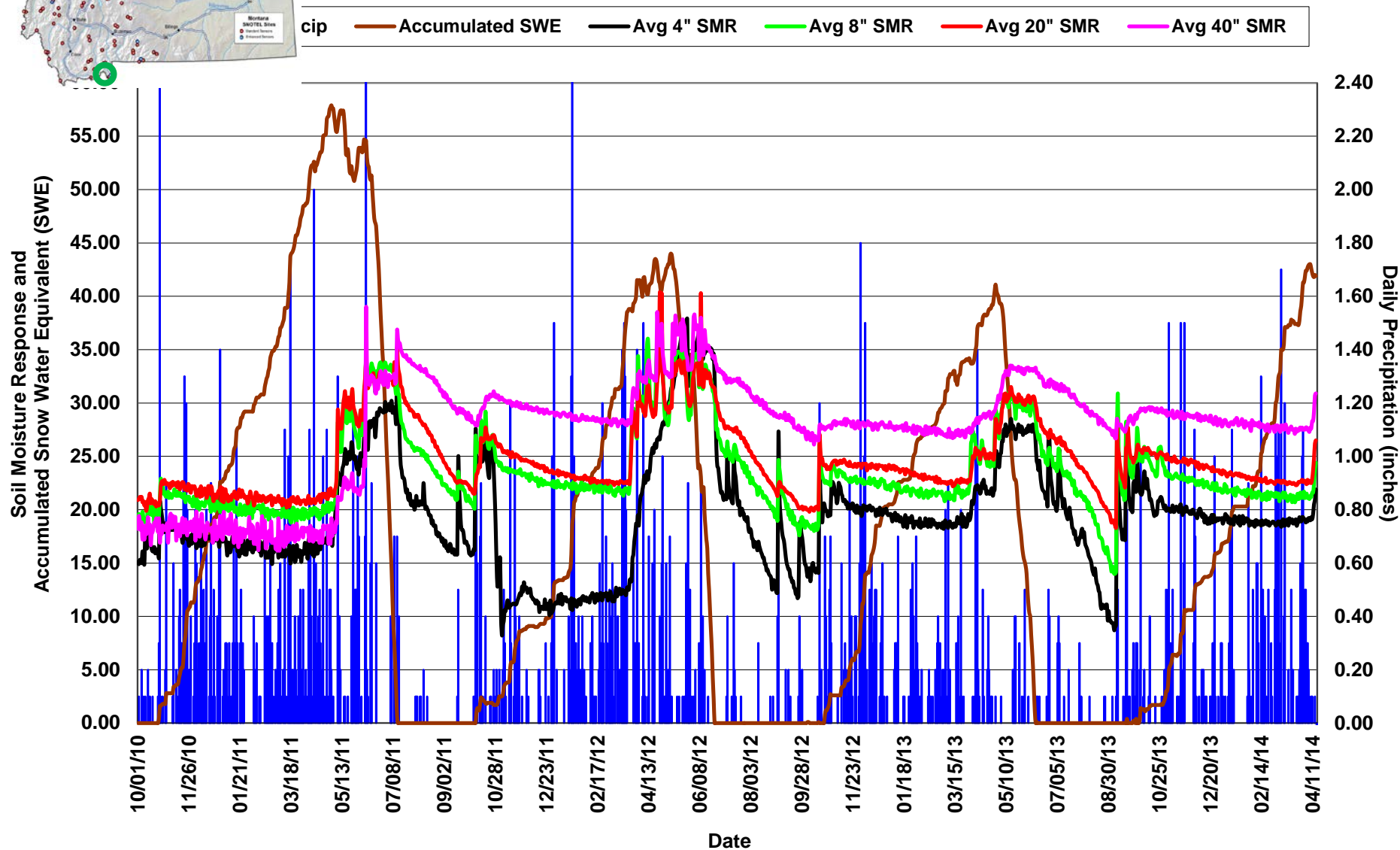
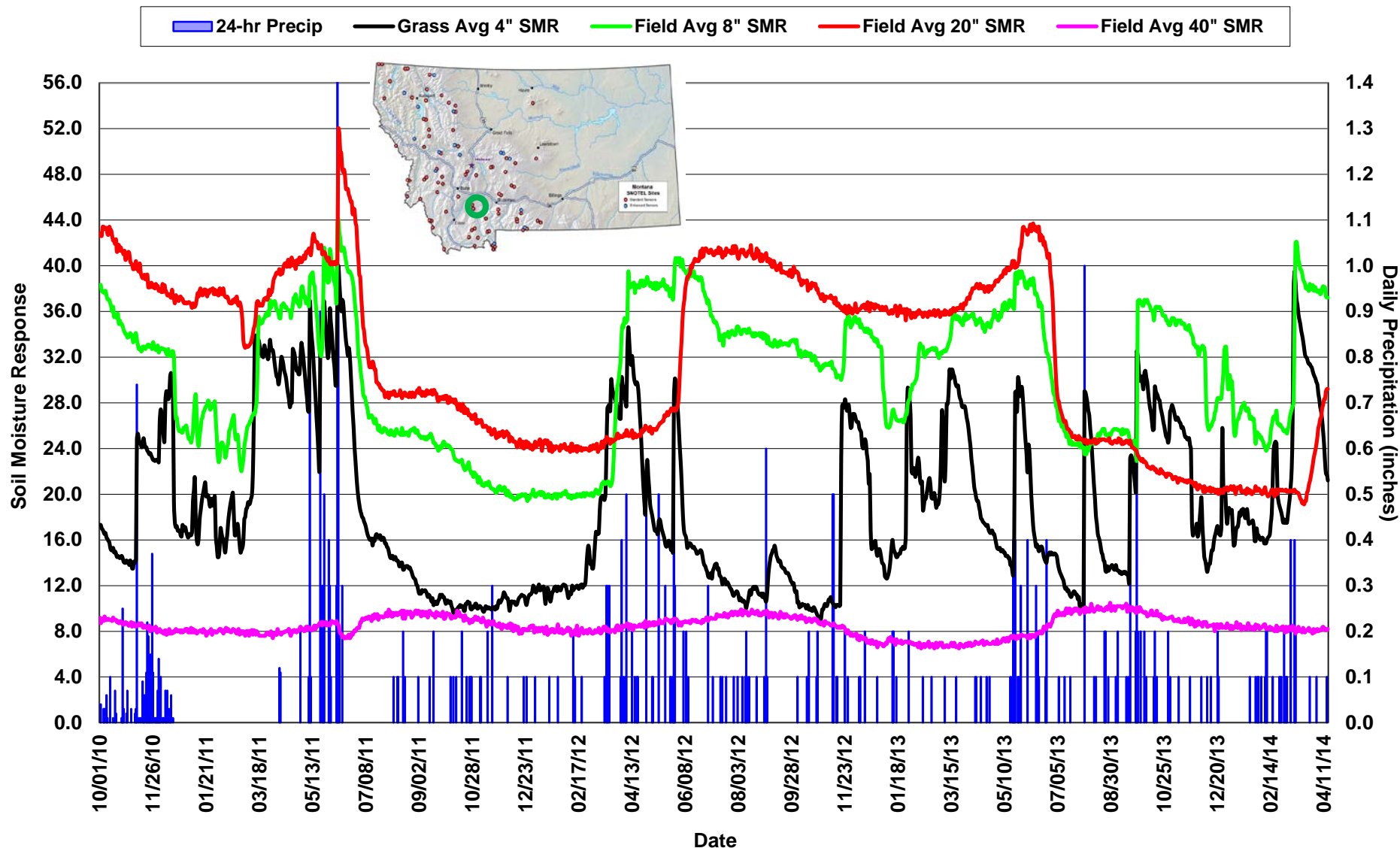




Table Mountain SCAN Water Year 2011-14  
Soil Moisture Response Data



## Summary

- Snowpack melt timing is right on queue
- Streamflows west of the continental divide are starting to show signs of melt
  - East of the divide only low elevation snowpacks are starting to melt
  - West of the divide mid elevations snowpacks are starting to melt while low elevations are melting
- Statewide snowpack is 133% of average
  - West of the divide snowpack is between 110 and 140% of average
  - East of the Divide snowpack ranges from 100 to 200% of average
- Snowpack typically peaks out right about now, so current percent of averages should be a direct reflection of spring & summer runoff
- Soil moisture at select locations are generally saturated where any rain and snowmelt runoff will not infiltrate the soil and go directly to streams & rivers
- Streamflow predications are projected to be 110 to 170% of average with a few outliers, be sure to refer to specific forecasts in your area

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If you wish to file a Civil Rights program complaint of discrimination, complete the [USDA Program Discrimination Complaint Form](#), found online at [http://www.ascr.usda.gov/complaint\\_filing\\_cust.html](http://www.ascr.usda.gov/complaint_filing_cust.html), or at any USDA office, or call (866) 632-9992 to request the form. You may also write a letter containing all of the information requested in the form. Send your completed complaint form or letter to us by mail at U.S. Department of Agriculture, Director, Office of Adjudication, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9419, by fax at (202) 690-7442, or email at [program.intake@usda.gov](mailto:program.intake@usda.gov).

Individuals who are deaf, hard of hearing or have speech disabilities and you wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish). Persons with disabilities, who wish to file a program complaint, please see information above on how to contact us by mail or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.), please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).



# Montana Snow Survey



**Governor's  
Drought & Water  
Supply Advisory  
Committee**

**Snow Survey and  
Water Supply  
Report**

**April 17<sup>th</sup>, 2014**

**Brian Domonkos  
Water Supply Specialist  
USDA NRCS Montana Snow Surveys  
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/>**

**Brian.Domonkos@mt.usda.gov  
406-587-6991**





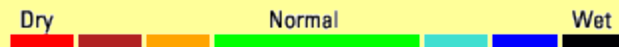
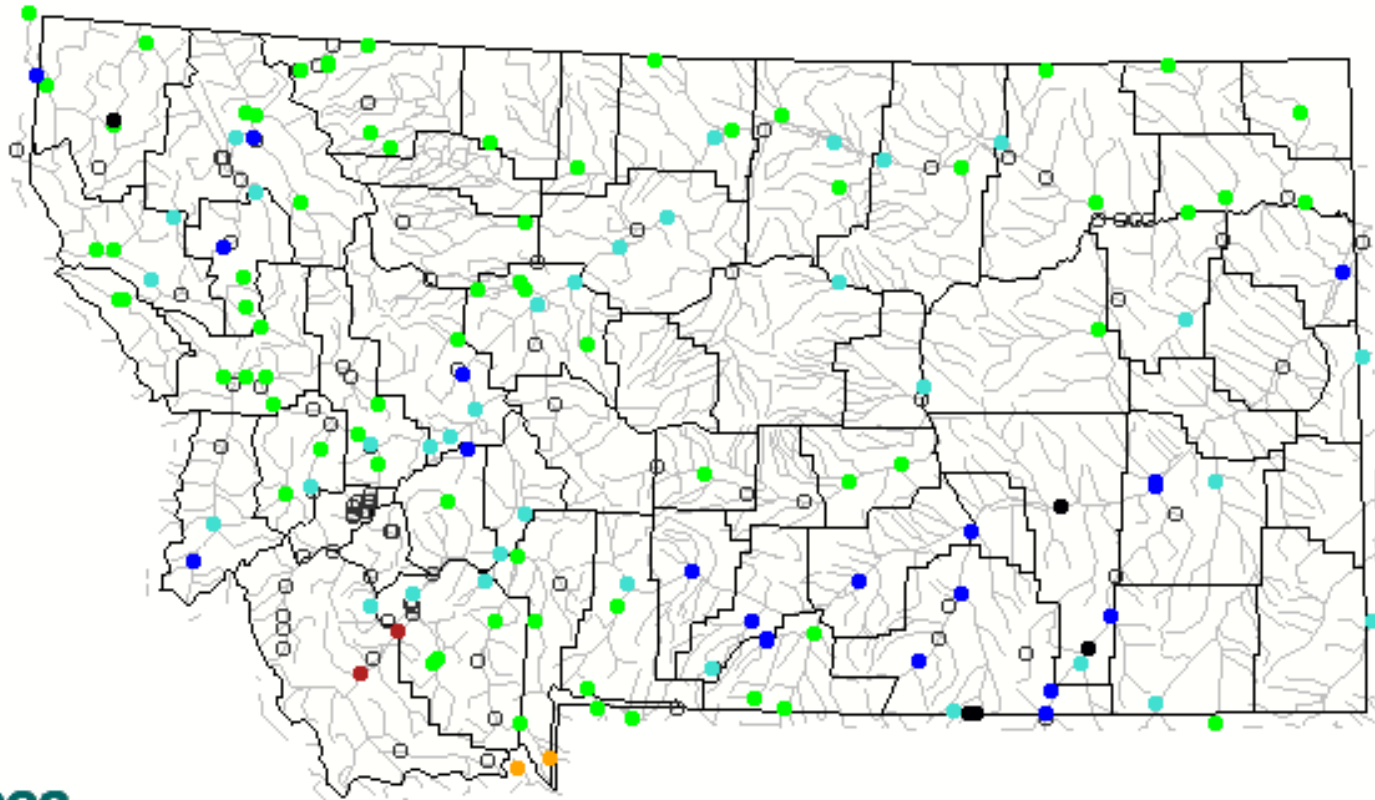
# USGS Streamflows, April 2014





# DAILY STREAMFLOW CONDITIONS

Wednesday, April 16, 2014 12:00ET



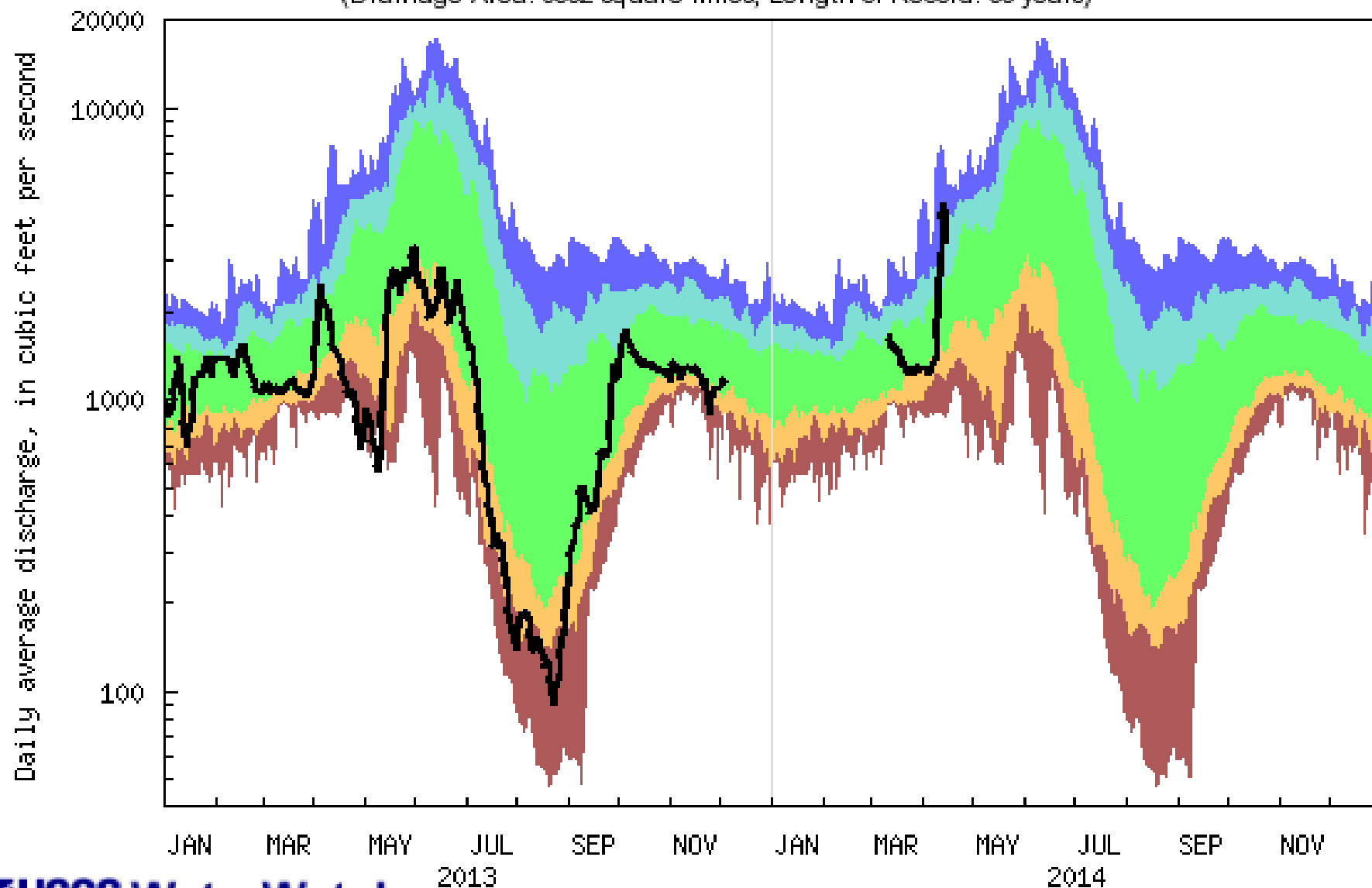
# Maximum Daily Discharge for April 16

06307616 – Tongue River at Birney Day School Bridge, near Birney

06309000 – Yellowstone River at Miles City

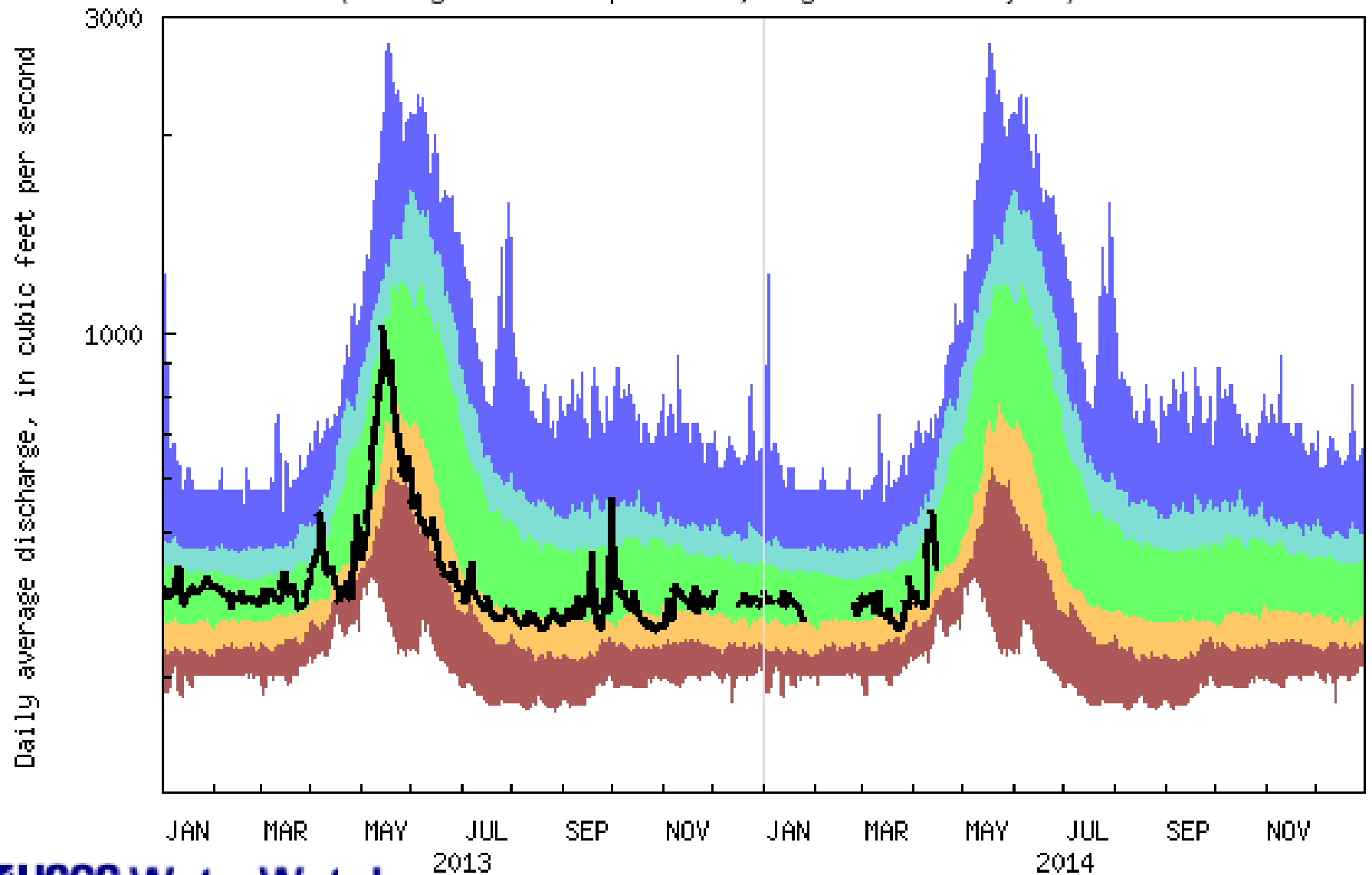
12301933 – Kootenai River below Libby Dam, near Libby

USGS 06036650 Jefferson River near Three Forks MT  
(Drainage Area: 9532 square miles, Length of Record: 33 years)



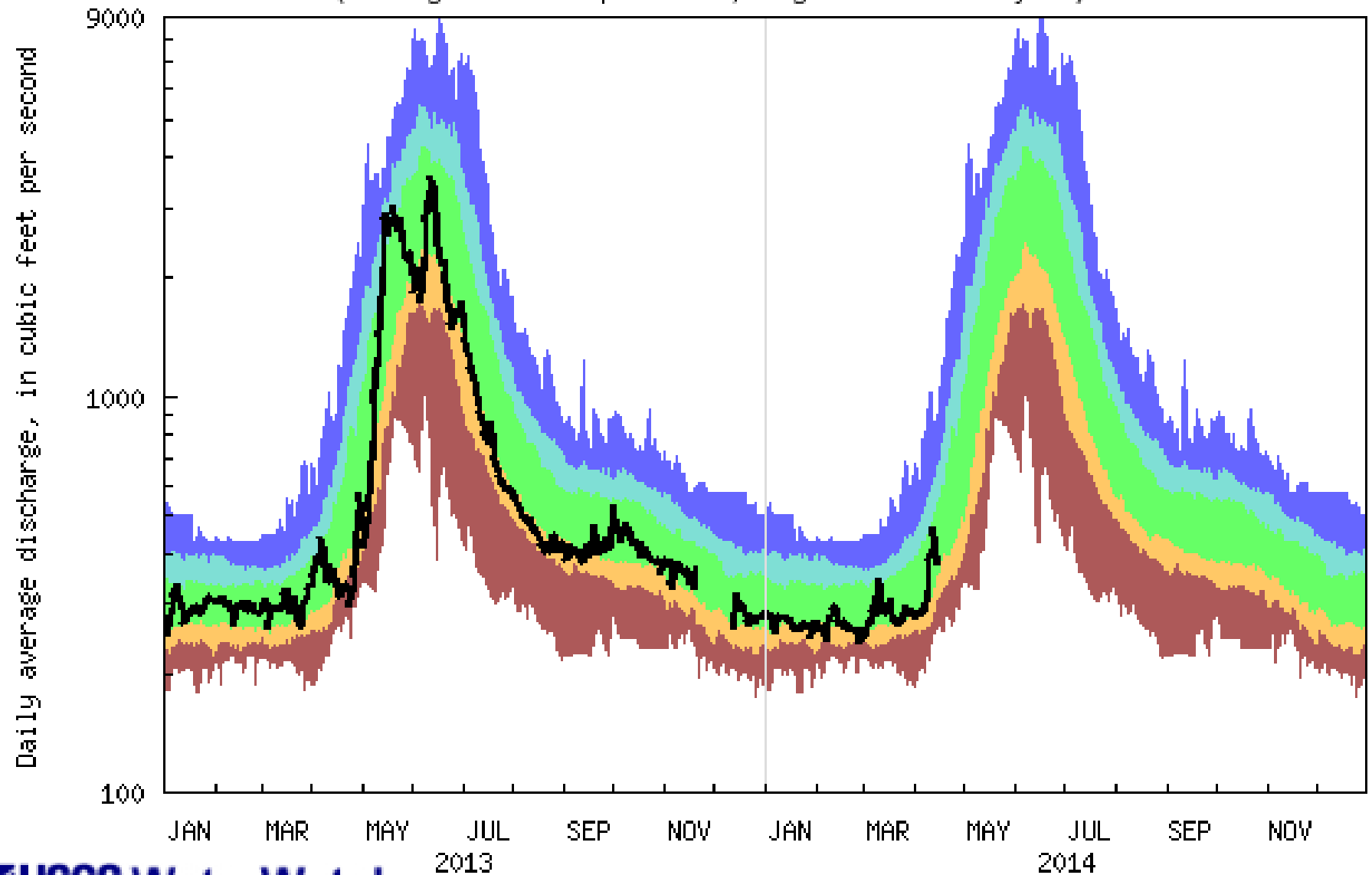
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06037500 Madison River near West Yellowstone MT  
(Drainage Area: 420 square miles, Length of Record: 99 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

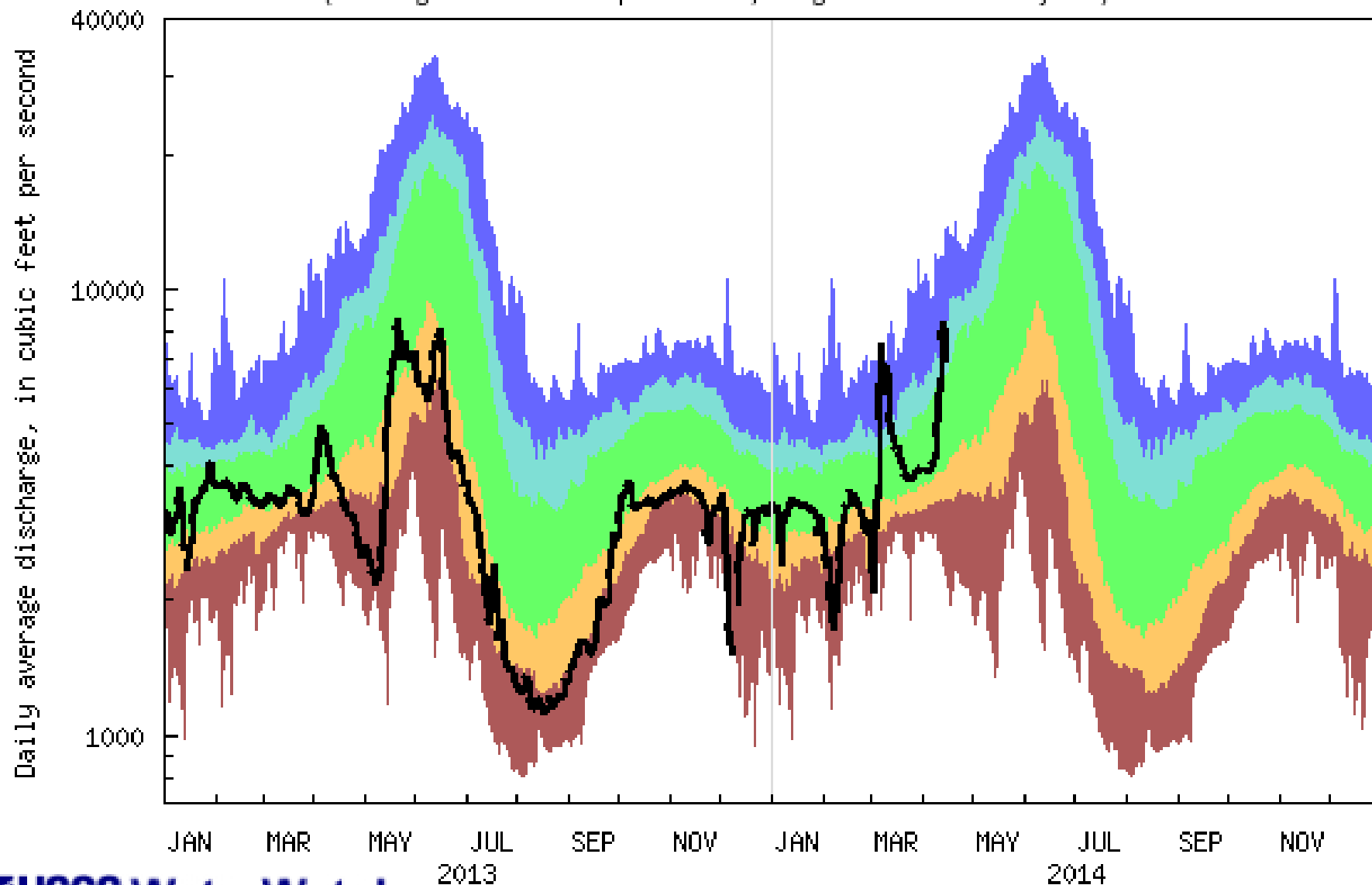
USGS 06043500 Gallatin River near Gallatin Gateway MT  
(Drainage Area: 825 square miles, Length of Record: 123 years)



Explanation - Percentile classes					Flow
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	
Much below normal	Below normal	Normal	Above normal	Much above normal	

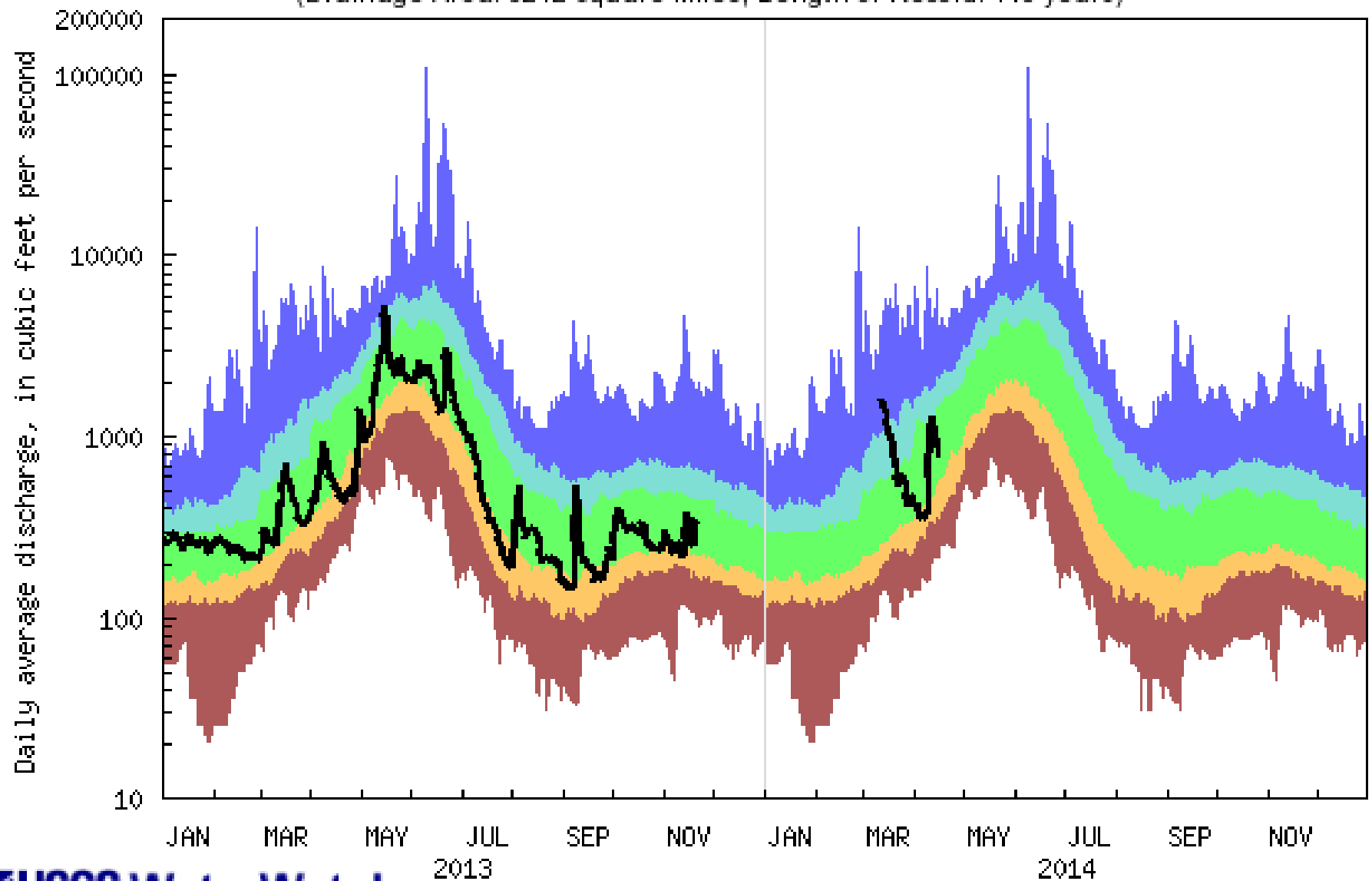


USGS 06054500 Missouri River at Toston MT  
(Drainage Area: 14669 square miles, Length of Record: 122 years)



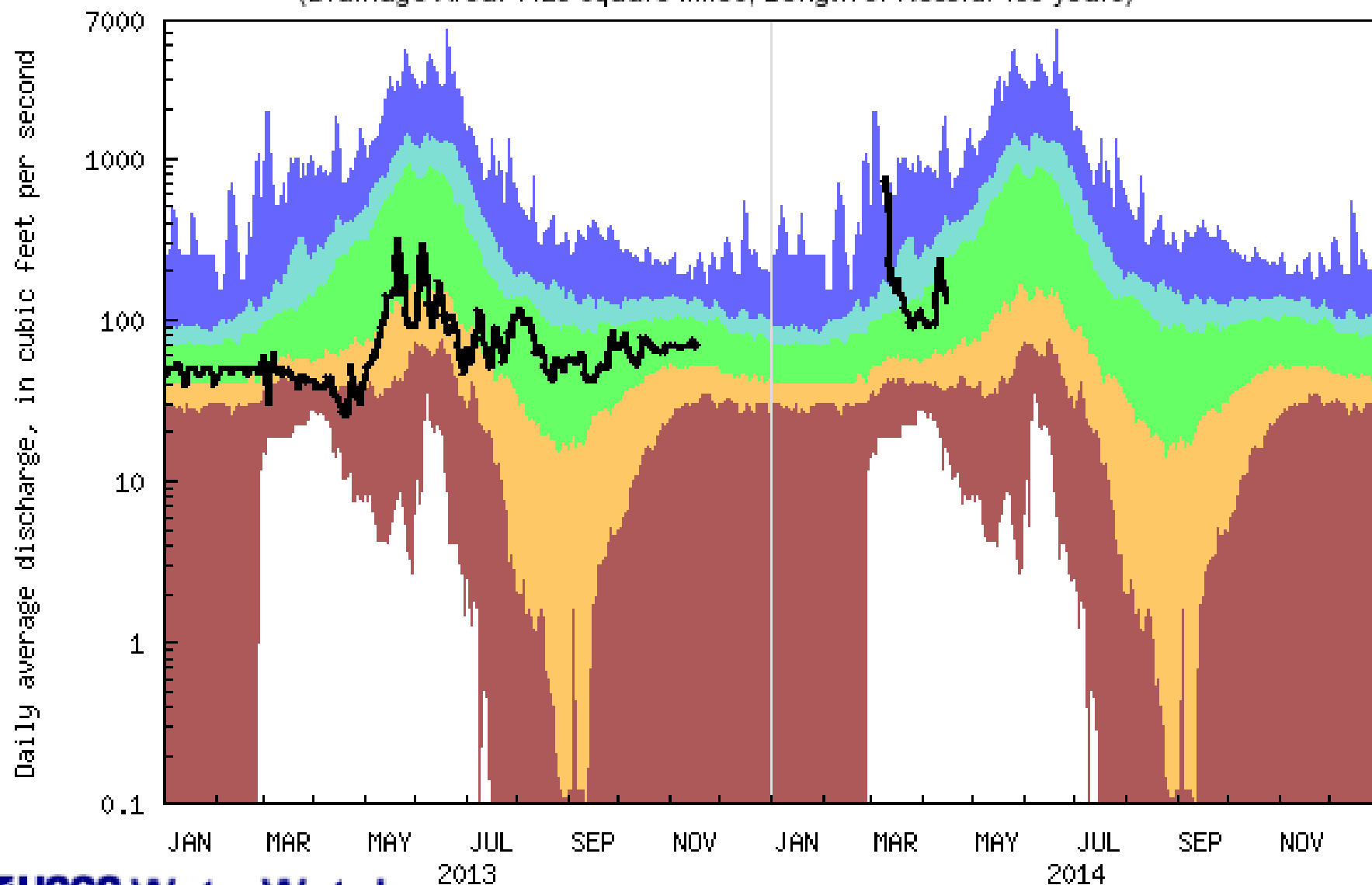
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06099500 Marias River near Shelby MT  
(Drainage Area: 3242 square miles, Length of Record: 110 years)



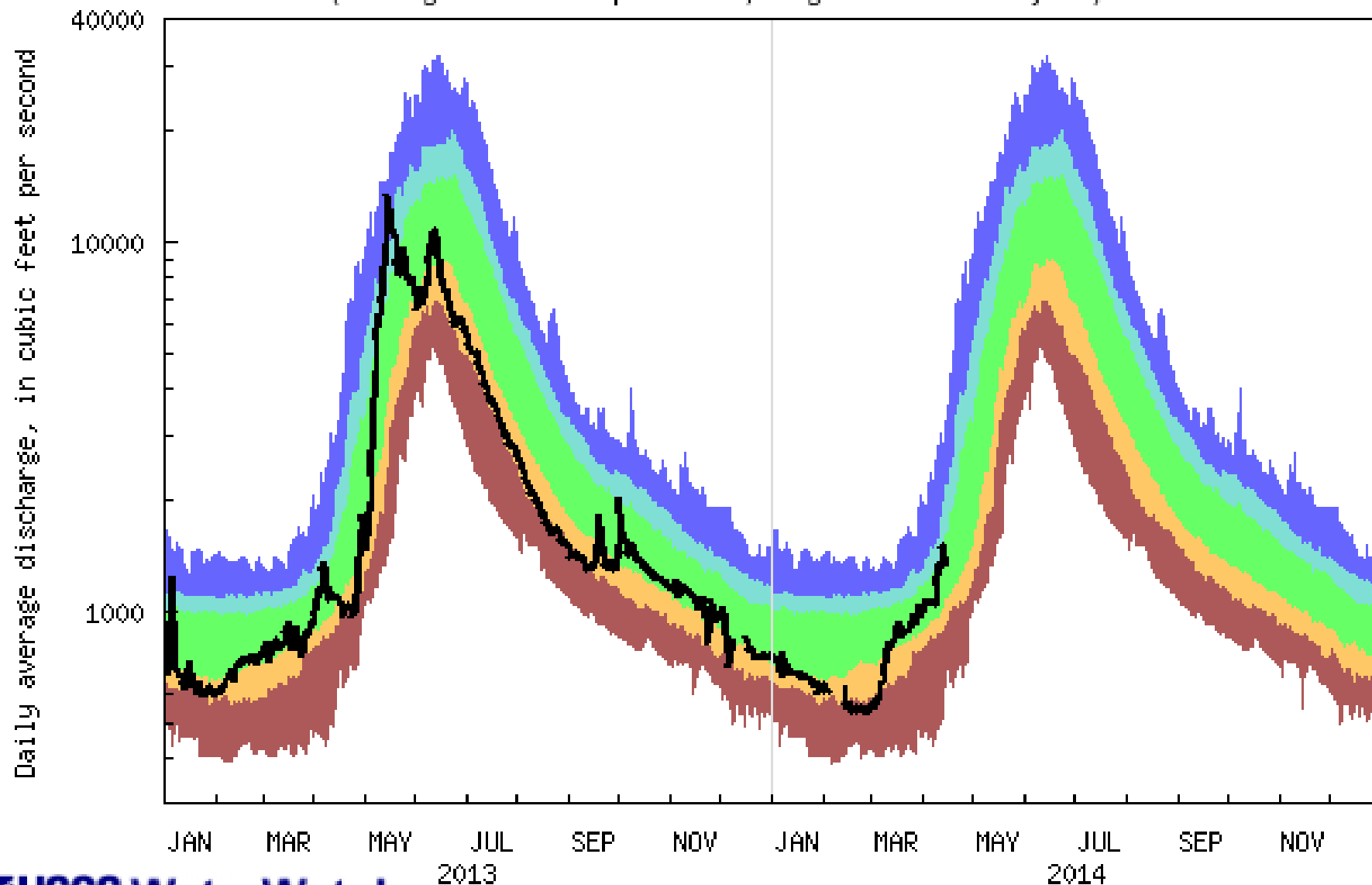
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06120500 Musselshell River at Harlowton MT  
(Drainage Area: 1125 square miles, Length of Record: 105 years)



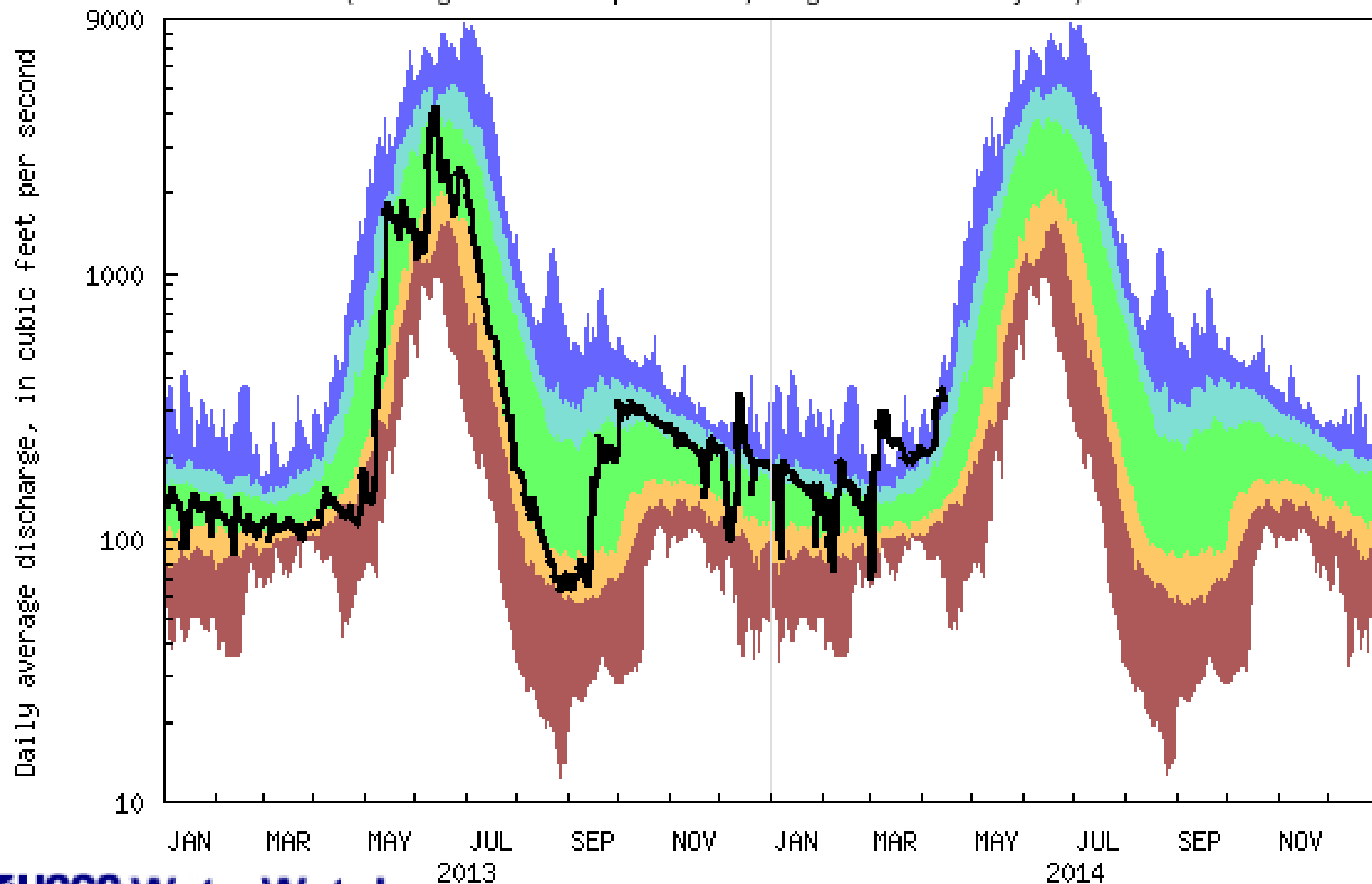
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06191500 Yellowstone River at Corwin Springs MT  
(Drainage Area: 2619 square miles, Length of Record: 123 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

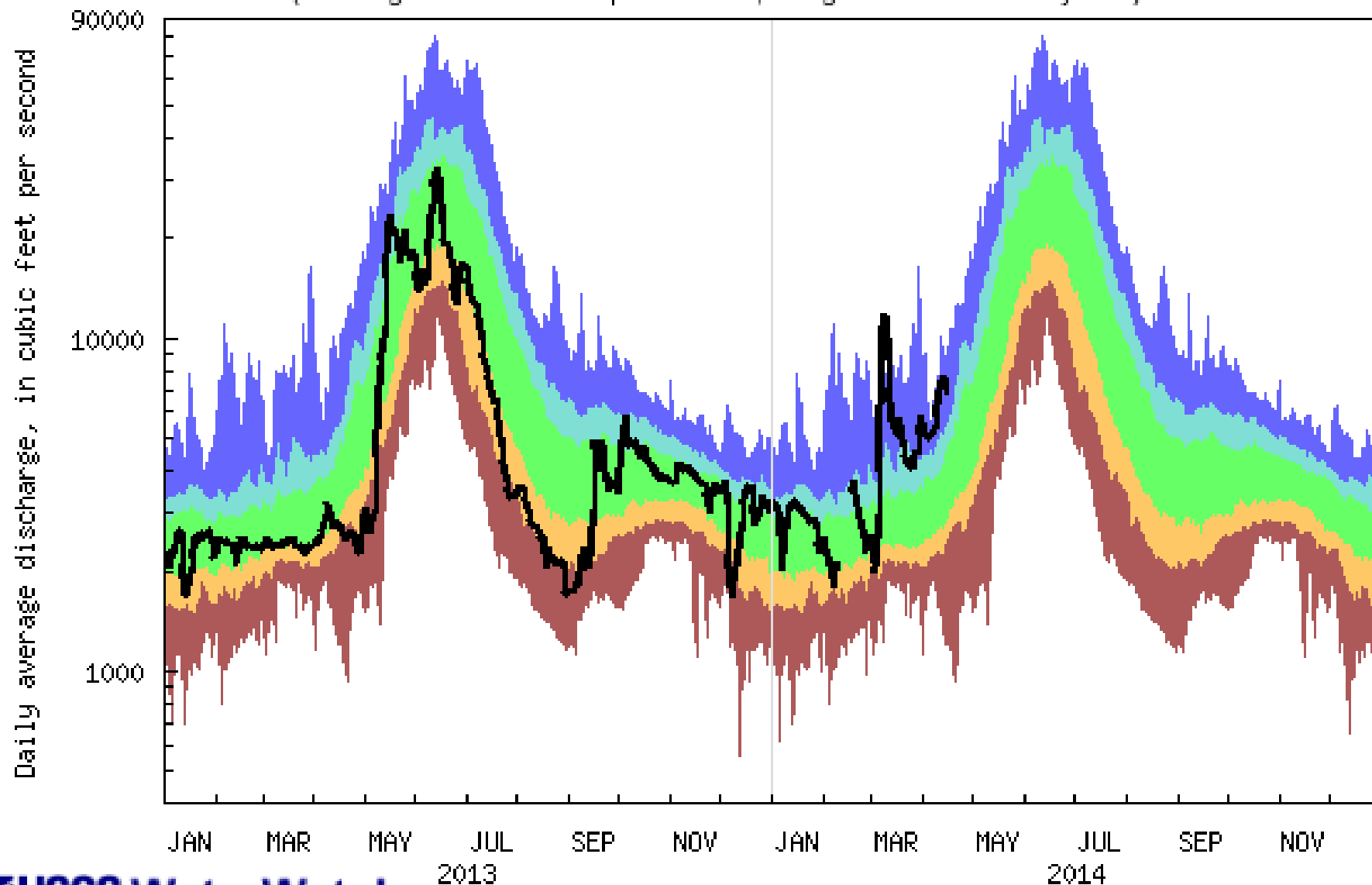
USGS 06200000 Boulder River at Big Timber MT  
(Drainage Area: 523 square miles, Length of Record: 65 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

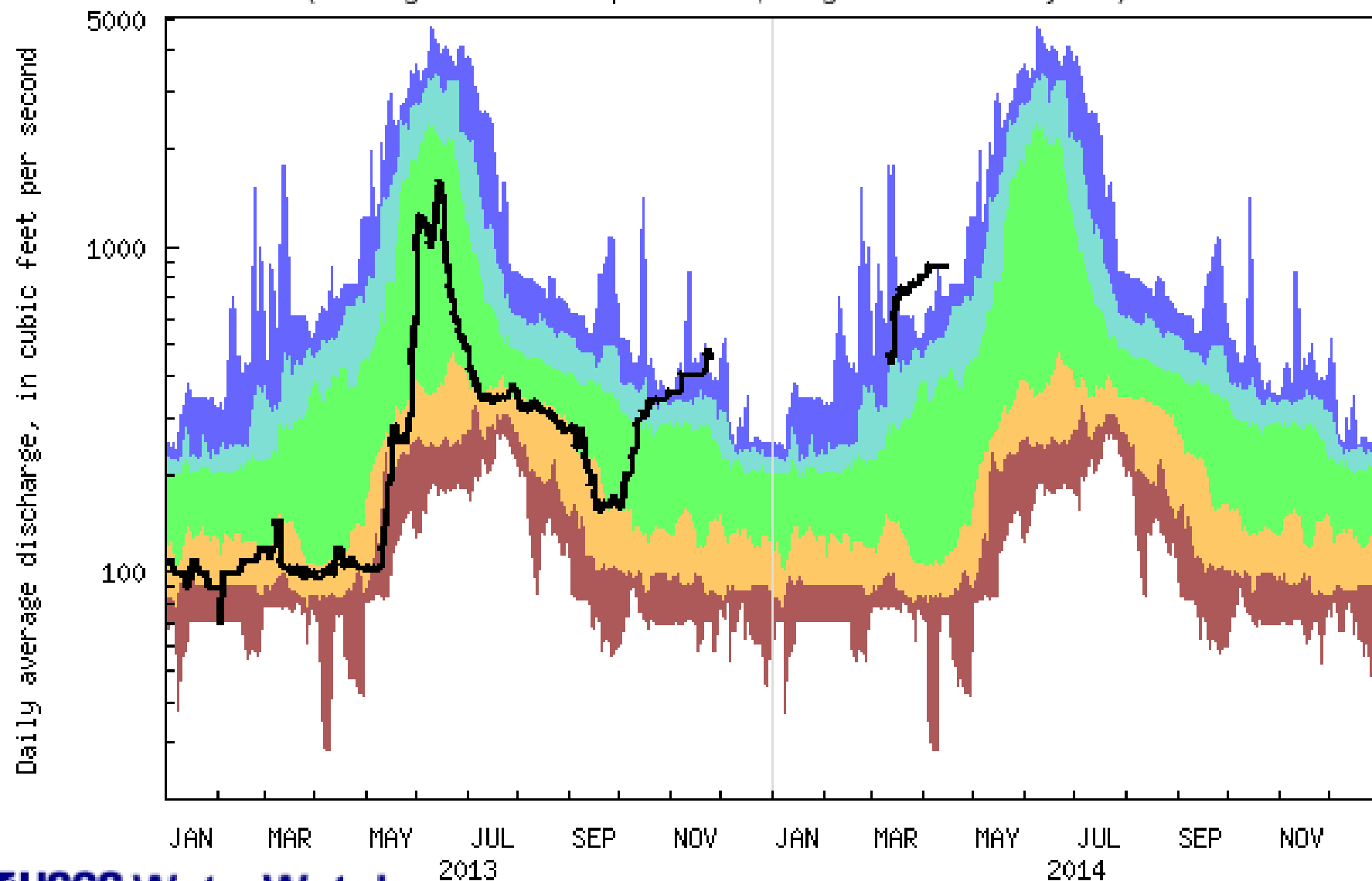


USGS 06214500 Yellowstone River at Billings MT  
(Drainage Area: 11805 square miles, Length of Record: 108 years)



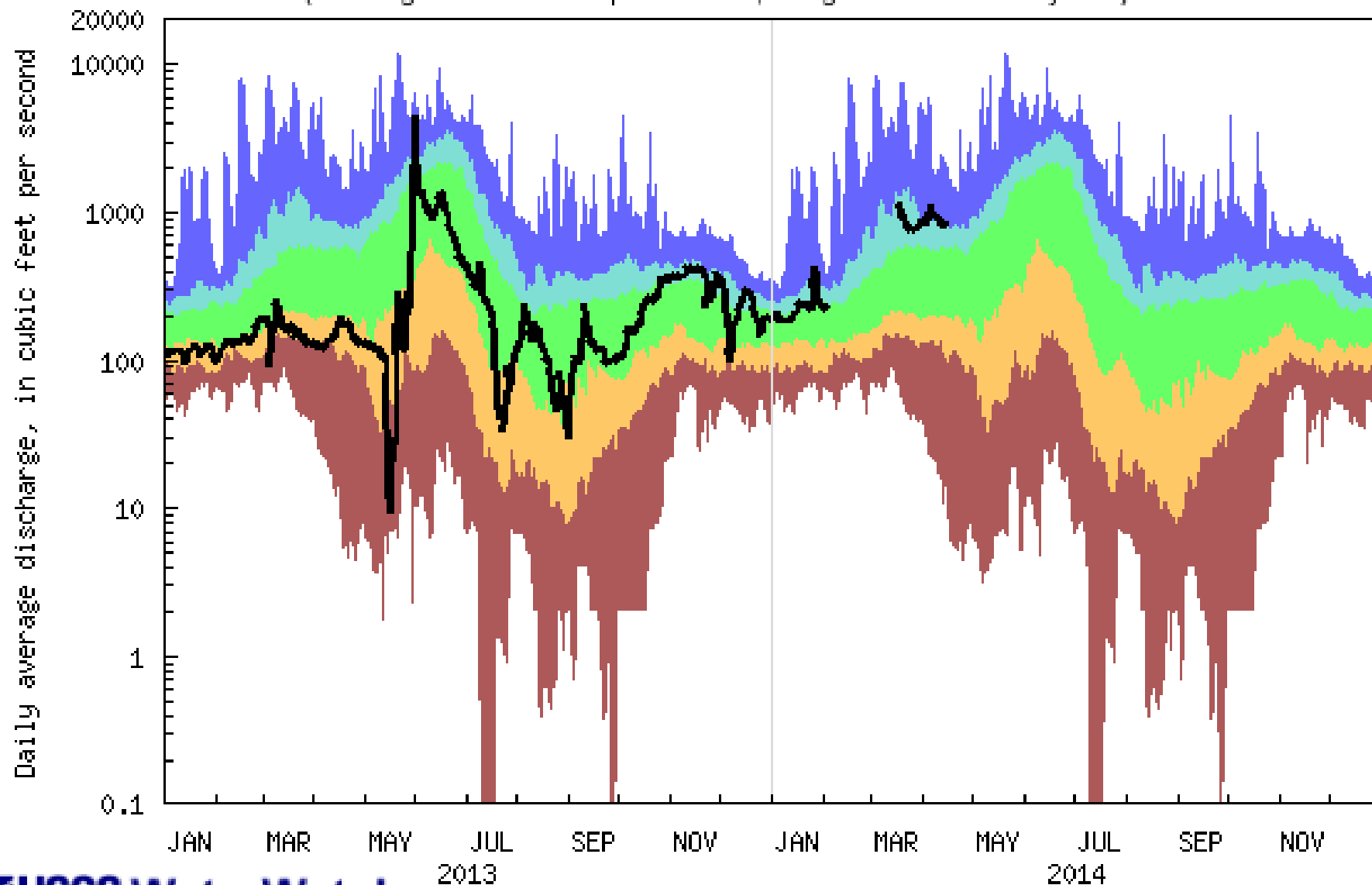
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06307616 Tongue R at Birney Day School Br nr Birney MT  
(Drainage Area: 2621 square miles, Length of Record: 33 years)



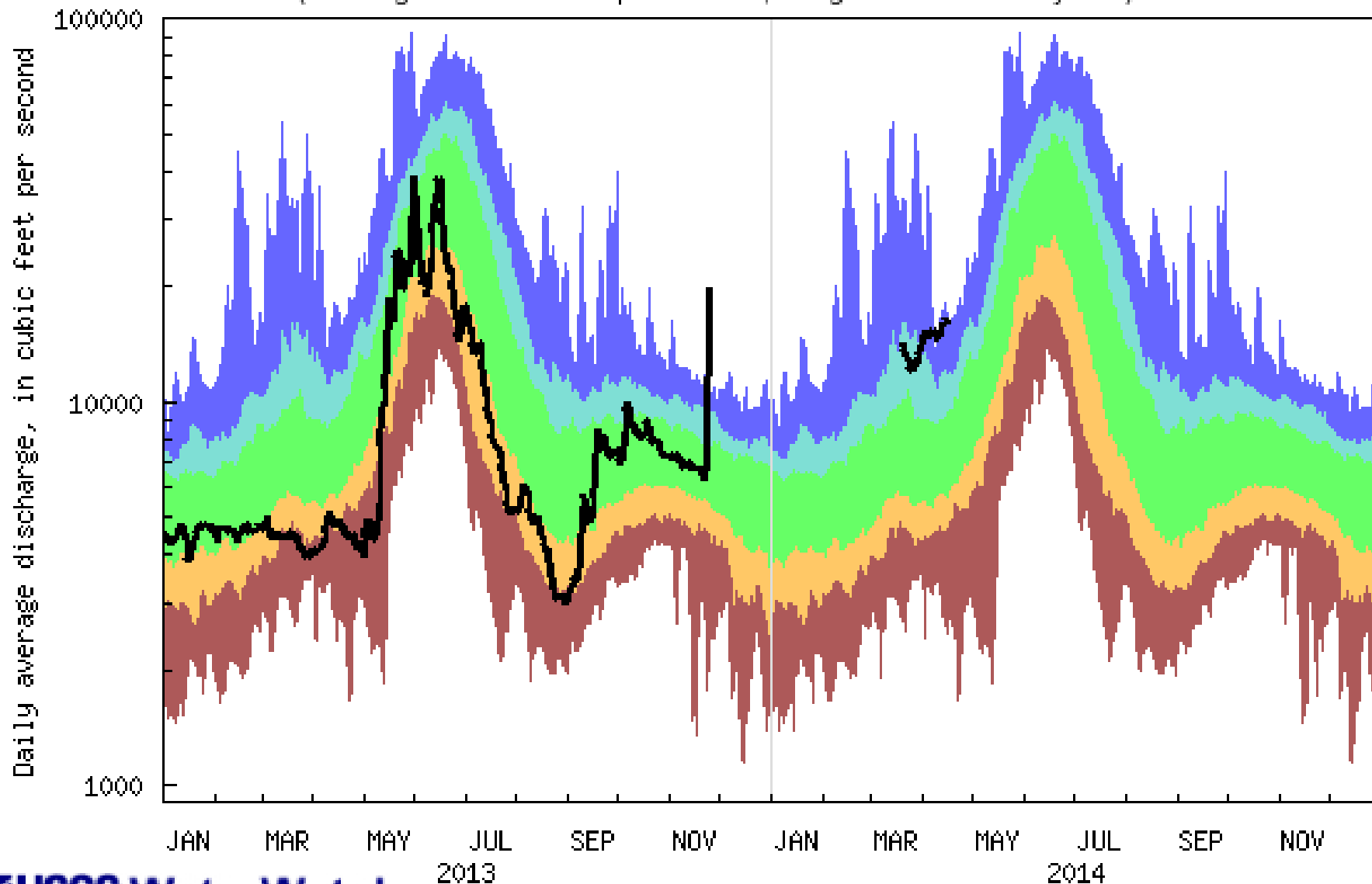
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06308500 Tongue River at Miles City MT  
(Drainage Area: 5397 square miles, Length of Record: 74 years)



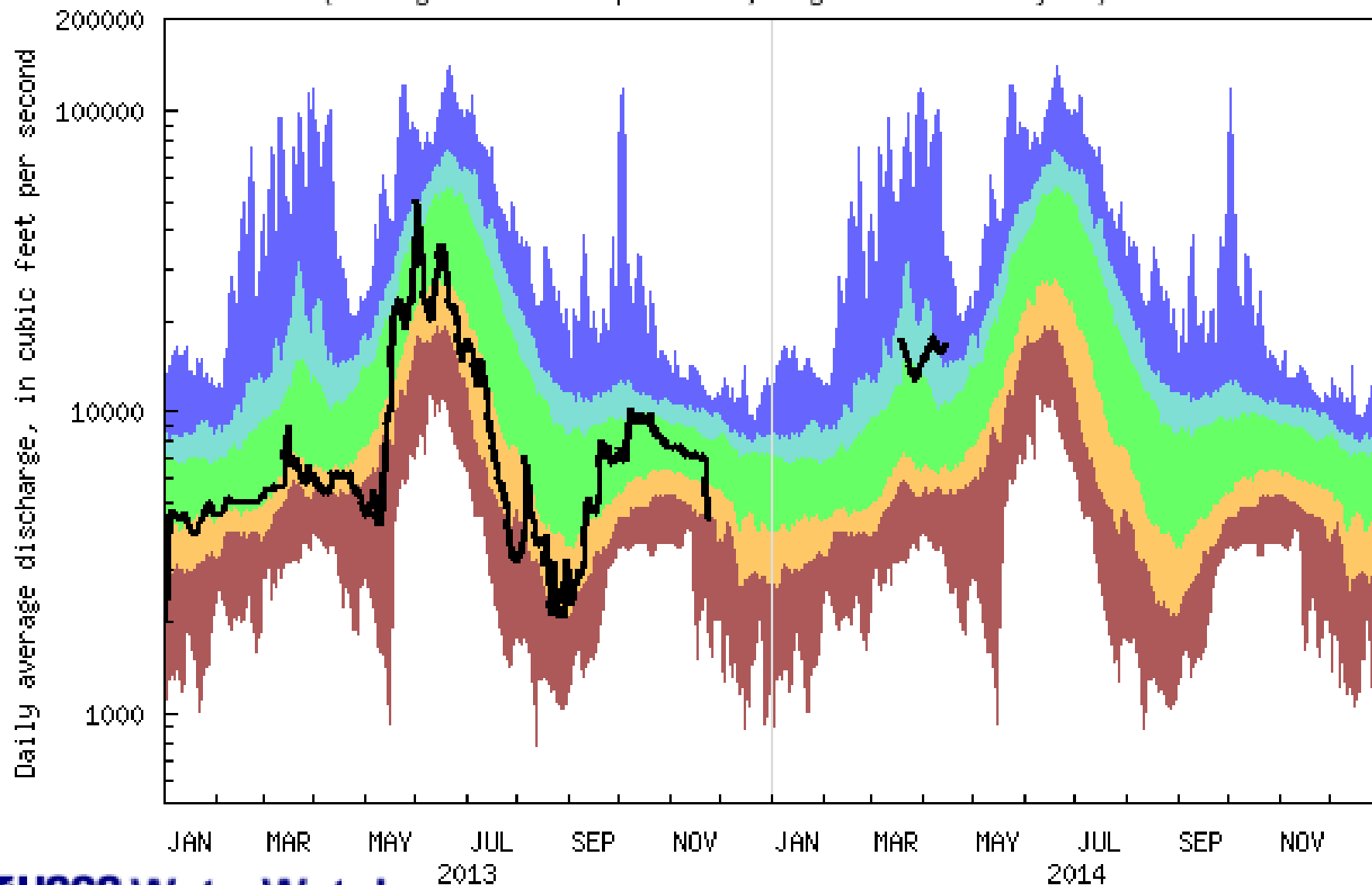
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06309000 Yellowstone River at Miles City MT  
(Drainage Area: 48253 square miles, Length of Record: 89 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

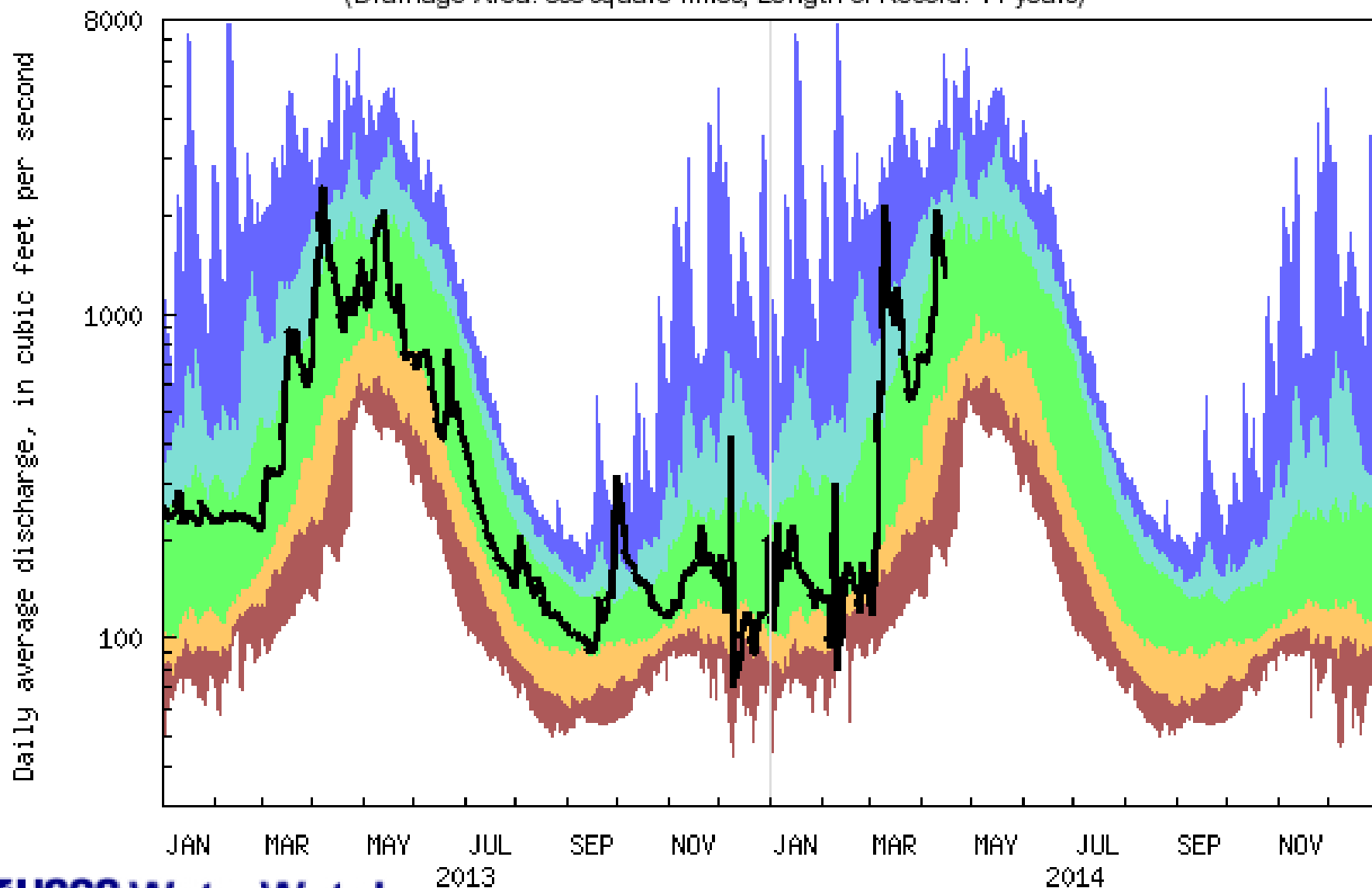
USGS 06329500 Yellowstone River near Sidney MT  
(Drainage Area: 69083 square miles, Length of Record: 101 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

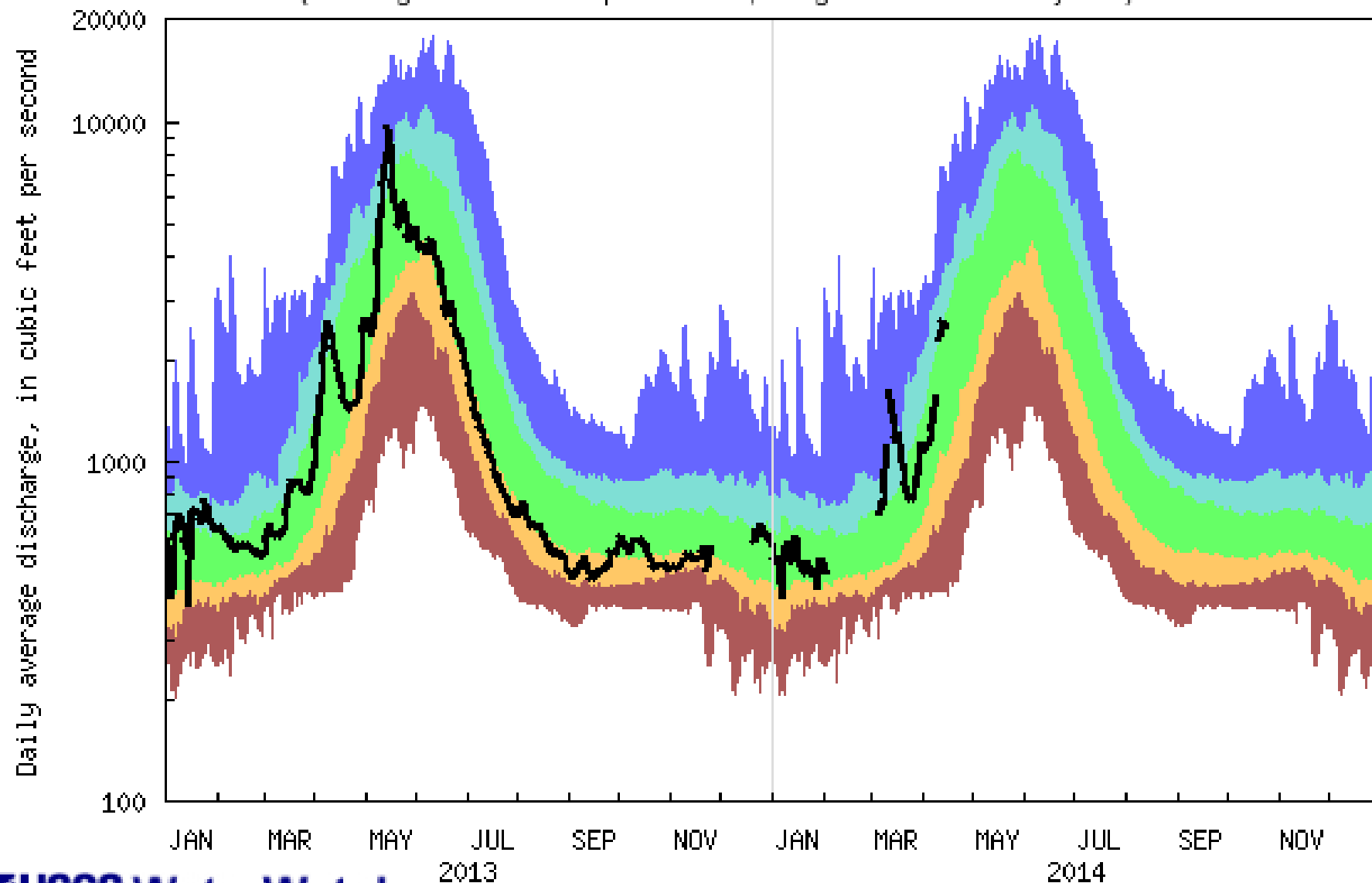


USGS 12302055 Fisher River near Libby MT  
(Drainage Area: 838 square miles, Length of Record: 44 years)



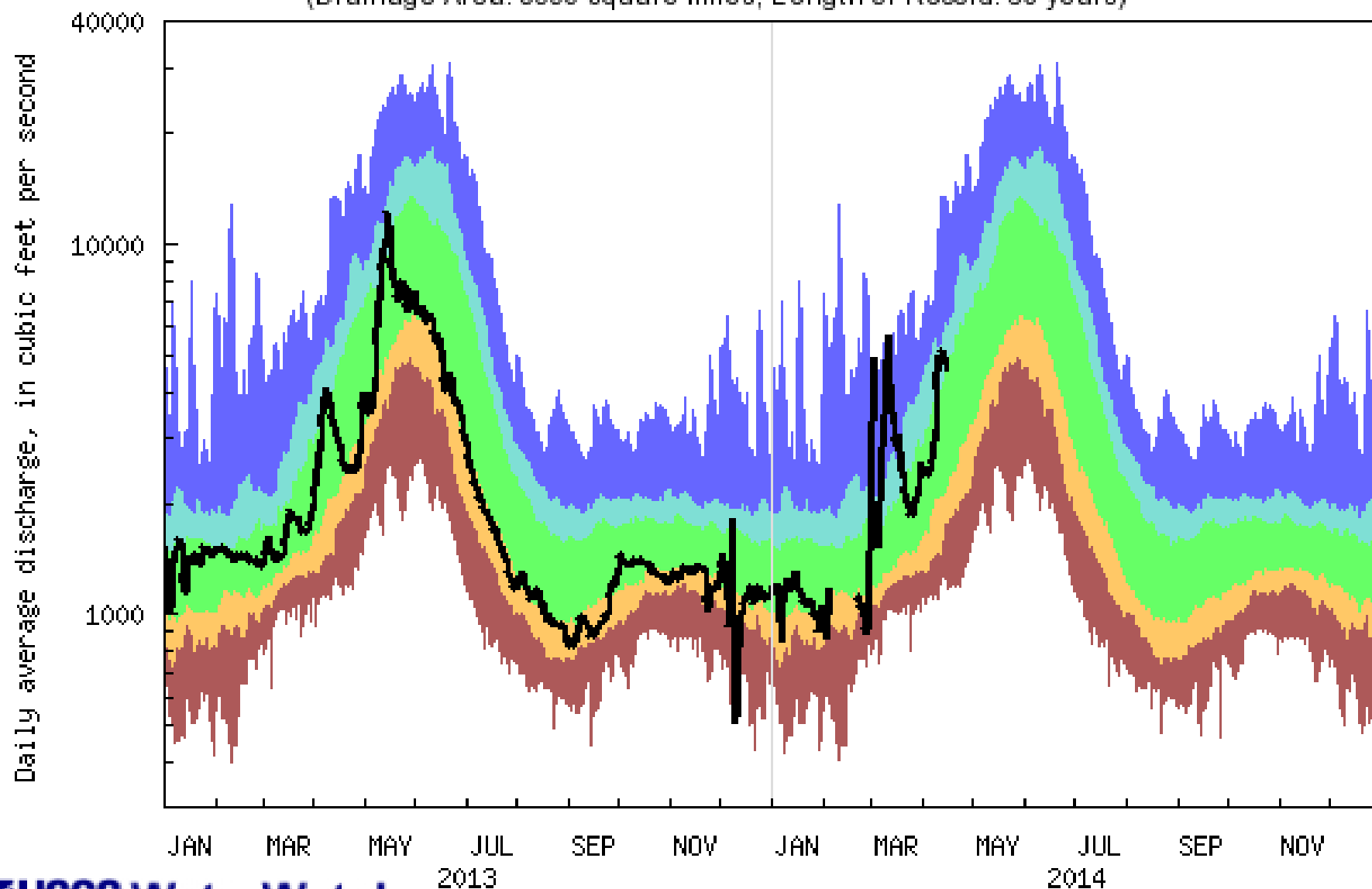
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12340000 Blackfoot River near Bonner MT  
(Drainage Area: 2290 square miles, Length of Record: 113 years)



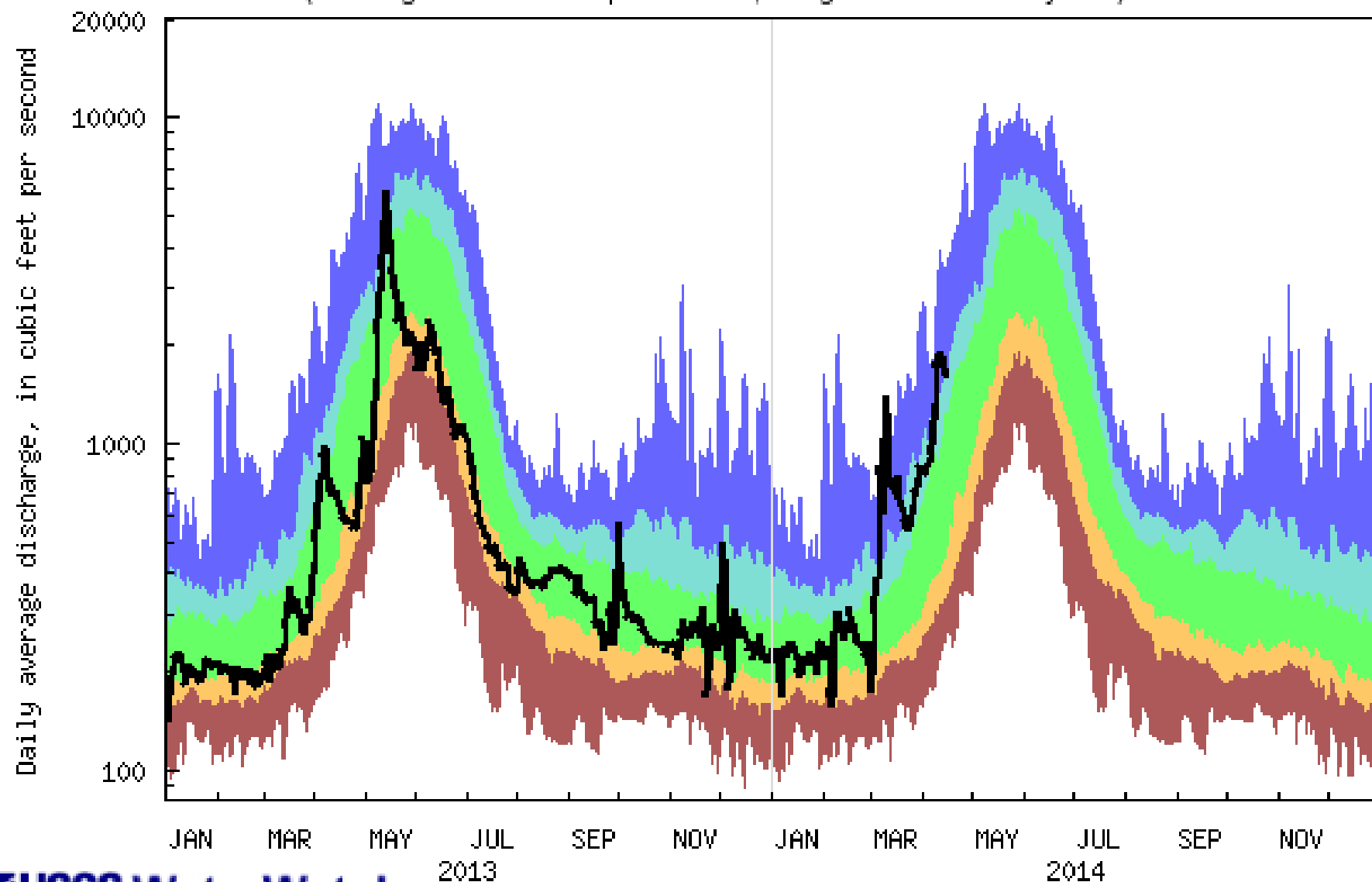
Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12340500 Clark Fork above Missoula MT  
(Drainage Area: 5999 square miles, Length of Record: 83 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12344000 Bitterroot River near Darby MT  
(Drainage Area: 1049 square miles, Length of Record: 74 years)

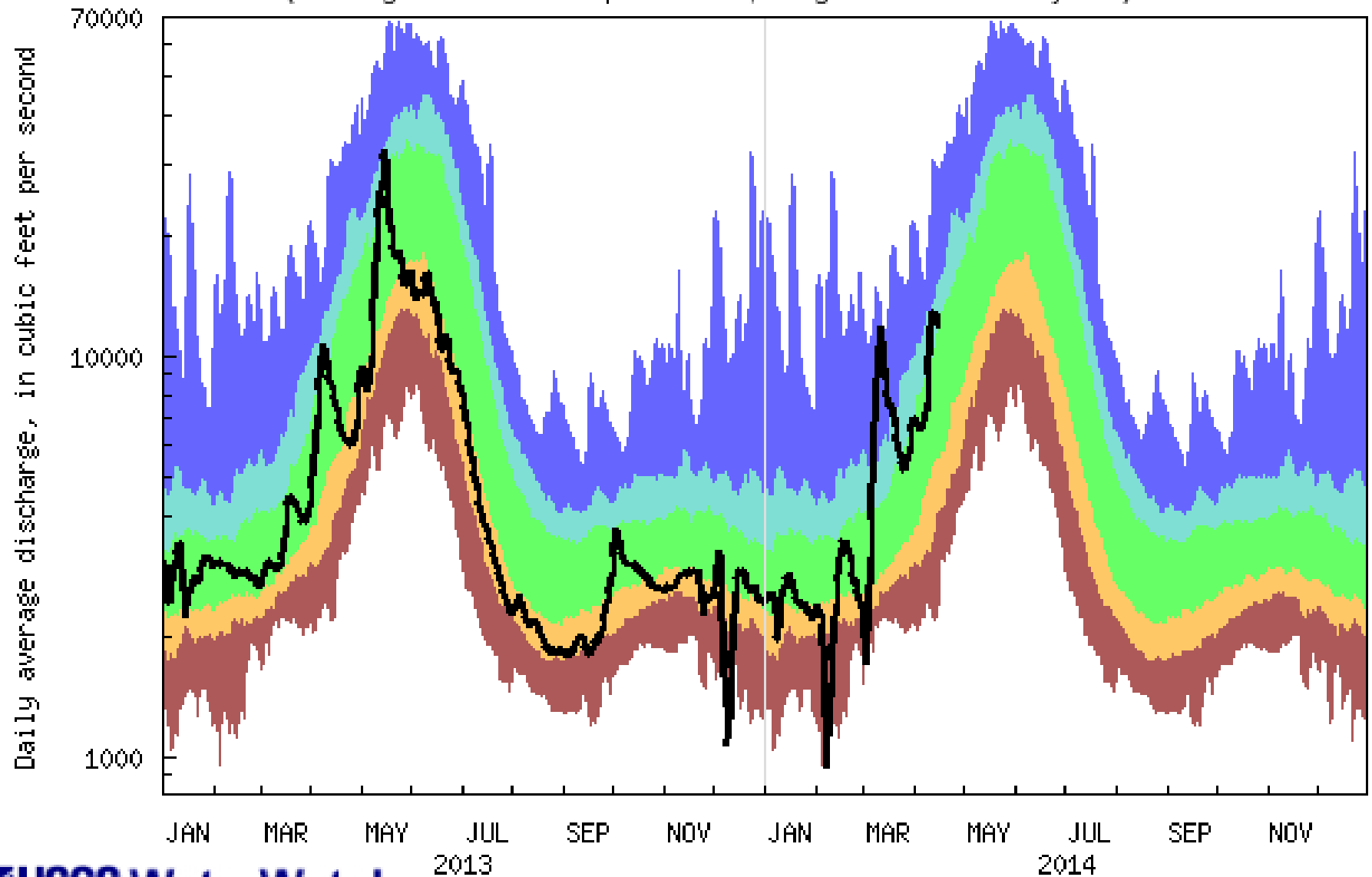


**USGS WaterWatch**

*Last updated: 2014-04-16*

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

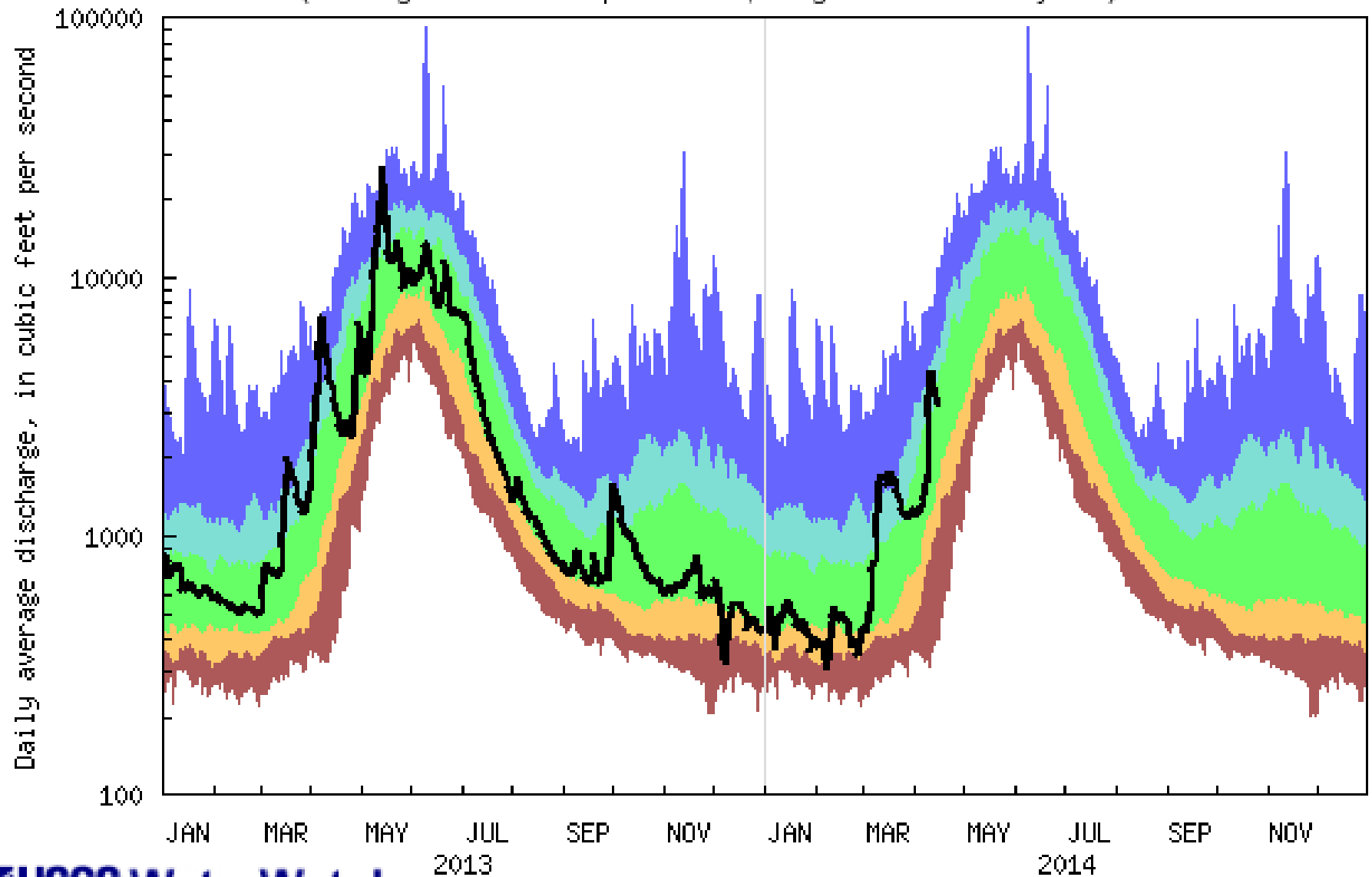
USGS 12354500 Clark Fork at St. Regis MT  
(Drainage Area: 10709 square miles, Length of Record: 101 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

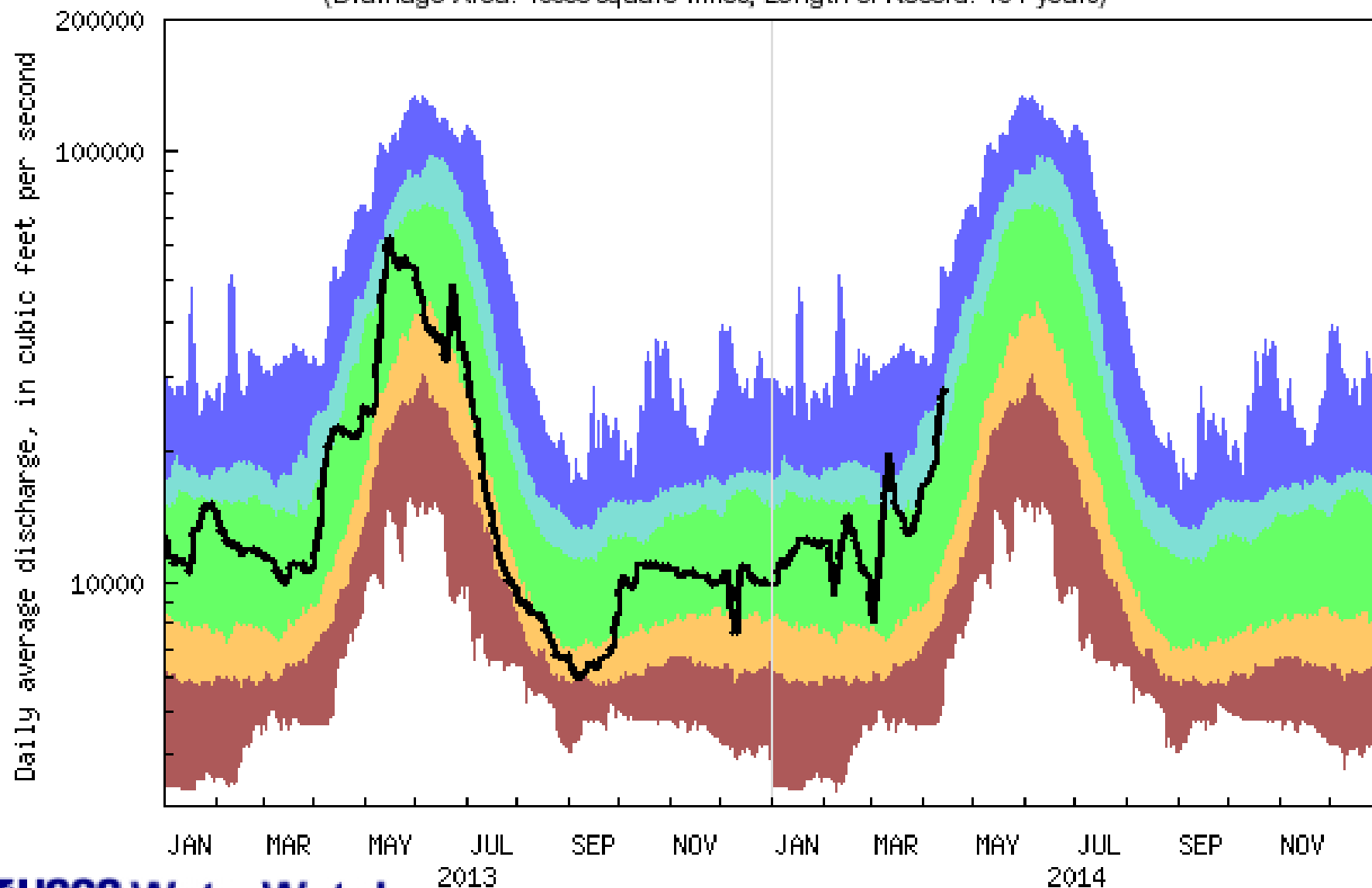


USGS 12358500 M F Flathead River near West Glacier MT  
(Drainage Area: 1128 square miles, Length of Record: 73 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12389000 Clark Fork near Plains MT  
(Drainage Area: 19958 square miles, Length of Record: 101 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	



USGS Home Page: <http://usgs.gov>

NwisWeb: <http://water.usgs.gov/mt/nwis>  
Access to streamflow (realtime and historical), water quality,  
and ground water information.

Montana District Home Page: <http://mt.usgs.gov>  
Montana Current Streamflow Conditions







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### Montana USGS Threatened and Endangered Stations - 4

**USGS to Discontinue Streamgages Due to Sequestration:** The U.S. Geological Survey (USGS) will discontinue operation of up to 375 streamgages nationwide due to budget cuts as a result of sequestration. Additional streamgages may be affected if partners reduce their funding to support USGS streamgages. The USGS is working to identify which streamgages will be impacted and will post this information as it becomes available. Streamgages are used nationwide to predict and address drought and flood conditions by monitoring water availability. The USGS and over 850 Federal, State, and local agencies cooperatively fund the USGS streamgaging network, which consists of over 8,000 streamgages. When budget fluctuations occur, the network is impacted.

If you have questions about specific stations or would like additional information, please contact Wayne Berkas (406-457-5903 [wrberkas@usgs.gov](mailto:wrberkas@usgs.gov)).

Hover mouse over station for number and name. Click station symbol for popup with a link to the station web page.







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## Montana Water Science Center

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### DATA CENTER

#### Real-time data (5)

- [Streamflow \(5\)](#)
- [Groundwater \(5\)](#)
- [Water quality \(5\)](#)
- [Lake/Reservoir \(5\)](#)
- [Monthly Conditions Report \(5\)](#)

#### Historical data

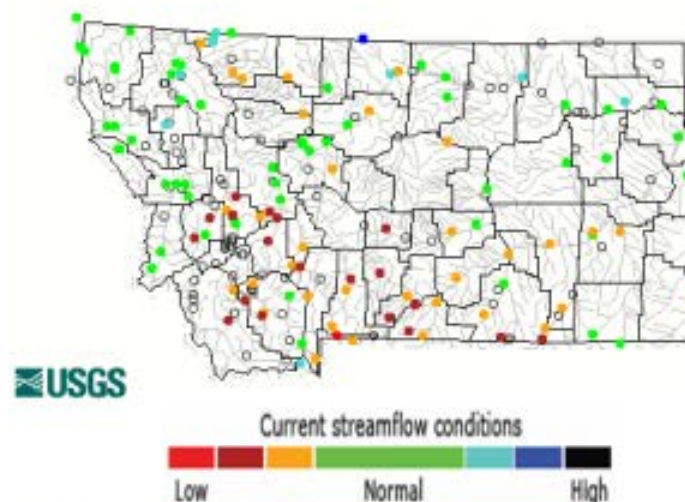
- [Streamflow \(5\)](#)
- [Groundwater \(5\)](#)
- [Water quality \(5\)](#)
- [Annual Data Reports](#)
- [Data Archive \(IDA\) for Montana](#)
- [Current & Discontinued Stations](#)

#### WaterWatch (5)

- [Floods | Droughts](#)
- [Current conditions](#)
- [Montana Flood Frequency and Basin-Characteristic Data](#)
- [Groundwater \(5\)](#)

## Water Resources of Montana

Wednesday, April 17, 2013 12:30ET



and for the administration of water rights.

Out of the 39 streamgages in Montana fully funded by NSIP, these four streamgages were selected to be discontinued because they had comparatively short records and their discontinuation was least likely to affect public safety because these streamgages were either used primarily by recreationalists and water users or similar streamgages nearby could provide at least some warning of flooding.

### Four Streamgages to be Discontinued

An approximately five percent cut in funding for the U.S. Geological Survey's National Streamflow Information Program (NSIP) for the last half of FY13 will result in the shutdown of four streamgages in Montana for the remainder of the fiscal year (Sept. 30, 2013). Streamgages that will be discontinued include:

- Jefferson River near Three Forks (34 years of record)
- Smith River below Eagle Creek near Fort Logan (16 years of record)
- Yellowstone River at Miles City (83 years of record)
- Bitterroot River near Missoula (27 years of record)

The Smith River is popular with floaters and fishermen and a permit lottery system has been established to control use of the stream. The Smith River streamgage below Eagle Creek near Fort Logan is used to determine floating conditions and select appropriate watercraft for floating. The Yellowstone River streamgage at Miles City is one of several streamgages on the main stem of the Yellowstone River used primarily for flood warning and control of downstream reservoirs. The Jefferson River streamgage near Three Forks and the Bitterroot River streamgage near Missoula are primarily used by floaters and fishermen